

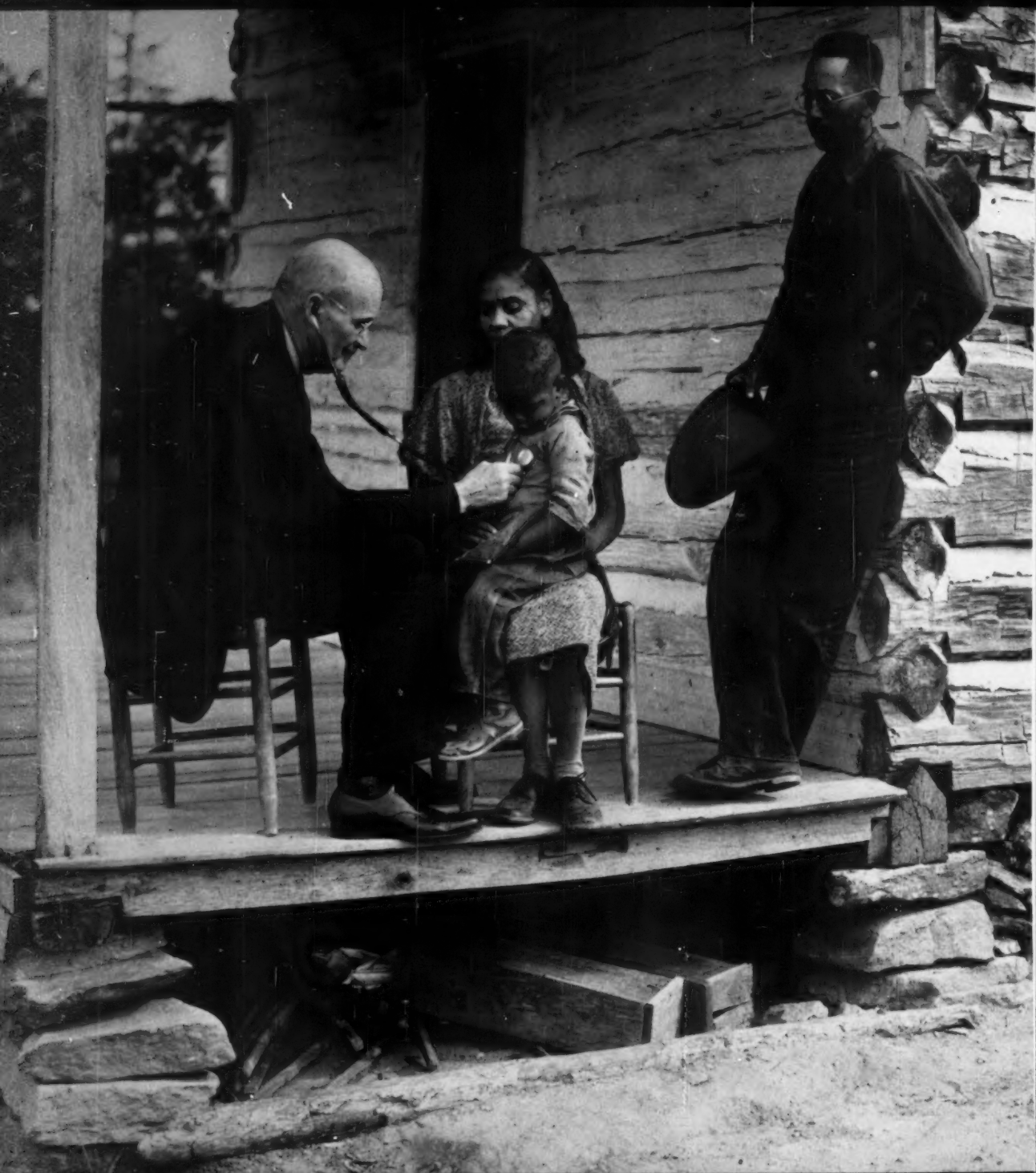
PUBLIC HEALTH REPORTS

In this issue



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service



PUBLIC HEALTH REPORTS

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CONTENTS

	<i>Page</i>
Two gastroenteritis outbreaks from ham in picnic fare. . . . <i>J. A. Googins, J. R. Collins, A. L. Marshall Jr., and A. C. Offutt</i>	945
Health studies of human populations. Conference summary.	955
Aspects of the Tecumseh study. Population studies. . . . <i>Thomas Francis, Jr.</i>	963
Interrelationship of poverty and disease. <i>M. Allen Pond</i>	967
Strategy in evaluating the effectiveness of community mental health programs. <i>David J. Vail</i>	975
A community mental health project in New York State. . . . <i>Catherine Covert Stepanek and Charles V. Willie</i>	979
Survival of uterine cancer patients in different-sized hos- pitals. Connecticut, 1935-51. <i>John C. Bailar III and Susan Levy Rice</i>	987
The city health department statistician. <i>Howard West</i>	995
Primary and secondary syphilis in the United States. . . . <i>Norman W. Axnick and William J. Brown</i>	999
Mortality from infectious hepatitis. Epidemiologic note. .	1006
Anthelmintic therapy program in a school using two formu- lations of dithiazanine. <i>M. M. Brooke, Francisco Febles, Jr., and Mary Bazemore</i>	1009

Continued▶



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The relationship between poverty and disease is discussed on
pages 967-974.

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BAILAR, JOHN C. III (National Cancer Institute), and **RICE, SUSAN LEVY**: *Survival of uterine cancer patients in different-sized hospitals. Connecticut, 1935-51. Public Health Reports, Vol. 76, November 1961, pp. 987-994.*

From 1935 through 1951, 6,220 patients with malignant tumors of the uterine cervix or corpus were reported to the Connecticut Tumor Registry. Comparison of the characteristics of patients admitted to hospitals of small, intermediate, or large size shows only minor differences in the age of the patients or in the stage of cancer at the time of diagnosis.

In all hospital-size groups, most cervical tumors were treated with radiation alone, while most corpus tumors were treated with surgery, either alone or in

combination with radiation.

Survival of corpus cancer patients did not seem to be related to the size of the hospital in which the patients were treated. There was no association between hospital size and survival rates for cervical cancer patients with localized tumors or for those with remote extensions or metastases. For cervical cancer patients with regional extensions, however, survival rates in the large hospitals were considerably higher than those in the small or intermediate hospitals.

AXNICK, NORMAN W. (Public Health Service), and **BROWN, WILLIAM J.**: *Primary and secondary syphilis in the United States. Public Health Reports, Vol. 76, November 1961, pp. 999-1005.*

During the fiscal years 1959 and 1960, national morbidity data indicated a significant increase in the incidence of primary and secondary syphilis in the United States. This rising trend has continued during the first 9 months of 1961. Venereal disease control personnel are confronted with the implications of the reported 12,000 cases in 1960 to a projected 19,000 cases in 1961.

These increases were reported from all geographic areas of the country and occurred in all age groups and in both sexes. The percentage increases in reported cases of infectious syphilis were approximately the same from both clinic and private physician reporting sources.

The data presented indicate that there has been some improvement in morbidity reporting and casefinding efficiency, as well as an actual increase in the inci-

dence of syphilis.

Morbidity reporting practices vary from State to State, and it is difficult to determine the exact extent to which improvement in reporting of infectious syphilis cases by private physicians has contributed to the national increases in the reported incidence of primary and secondary syphilis.

Intensified casefinding activities and improved epidemiologic techniques also contributed their share to the national increases. In order to hasten an ultimate reduction in the incidence of syphilis in the United States, extension of these improved casefinding measures is needed in the control program. Furthermore, an increasing excess of male cases over female cases indicates the need for further epidemiologic studies on the modes of transmission of syphilis.

CONTENTS *continued*

Primary needs in occupational health.....	Page 1019
<i>Albert E. Heustis</i>	
Public health and the aging population.....	1023
<i>Nathan W. Shock</i>	
Dental officer career development.....	1029
<i>Norman F. Gerrie</i>	
Symposium on biological communications.....	1034
Psychiatric clinic outpatients, Maryland.....	1041
Short reports and announcements:	
Influenza vaccination recommended.....	954
Conference on science manuscripts.....	962
Mental illness.....	966
High calcium diet for osteoporosis.....	974
Parents' primer on television.....	985
International mail pouch.....	986
Medical self-help training program.....	994
Electronic larynx.....	998
Fellowships for health workers.....	1005
Narcotic control.....	1008
Program notes.....	1018
Health exhibit in Rome.....	1022
Housing for the elderly.....	1027
Translated readings.....	1028
Epidemiology for nurses.....	1033
U.S. birth rates.....	1036
Air pollution nuisance. Legal note.....	1037
Publication announcements.....	1038
Areawide planning for hospital facilities.....	1039
Federal publications.....	1043

Published concurrently with this issue:

PUBLIC HEALTH MONOGRAPH No. 65 . . . Methodological
Study of Population of Outpatient Psychiatric Clinics,
Maryland, 1958-59. *Anita K. Bahn*

Summary and information on availability appear on page 1041.

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BROOKE, M. M. (Public Health Service), FEBLES, FRANCISCO, Jr., and BAZE-MORE, MARY: Anthelmintic therapy program in a school using two formulations of dithiazanine. Public Health Reports, Vol. 76, November 1961, pp. 1009-1017.

Pretreatment stool examinations indicated that 68 percent of the Puerto Rican children in a Philadelphia elementary school harbored helminths, principally *Trichuris trichiura*.

A 10-day therapy program was instituted using two formulations of the broad-spectrum anthelmintic, dithiazanine, to treat 128 infected or unexamined Puerto Rican children. A placebo was given to the remaining 262 children.

During the first 5 days of therapy, 36 percent of the children on dithiazanine II, 39 percent on dithiazanine amberlite, and 23 percent on the placebo had side reactions. The relative intolerance to dithiazanine II increased during the second 5 days of therapy. With the exception of excessive vomiting by two children who were removed from therapy with dithiazanine II on the 9th day, the side effects did not constitute a serious problem.

Dithiazanine II (tablets) was significantly more effective than dithiazanine amberlite (capsules) against *T. trichiura* (85 percent versus 44 percent cured; 97 percent versus 75 percent, reduction in egg counts). Although dithiazanine II appeared more effective against hookworm, the differences were not statistically significant.

Dithiazanine II has promise as a suitable drug for mass therapy against nematode infections, since it appears to be more effective and better tolerated than the presently available commercial dithiazanine product. However, in view of the relatively light infections in most children and the spontaneous loss of worms over a period of years, it is questionable whether mass therapy against nematode infections harbored by Puerto Rican children is necessary in schools located in the northern United States, which is outside the recognized endemic areas for these parasites.

Two Gastroenteritis Outbreaks From Ham in Picnic Fare

J. A. GOOGINS, M.D., M.P.H., J. R. COLLINS, B.S., A. L. MARSHALL, Jr., M.D., and
A. C. OFFUTT, M.D., LL.D.

IN AUGUST 1959, two massive food poisoning outbreaks occurred in Indiana which were remarkably similar in many respects. Although circumstances that produce staphylococcal food poisoning are well recognized, outbreaks of this disease continue to occur with dismaying frequency. We are adding this report to an extensive bibliography of reported staphylococcal food poisoning outbreaks to document the large number of persons affected and to demonstrate again the need for education in food sanitation practices for persons participating in large feeding operations.

Similarities between the two outbreaks were many. Both occurred in conjunction with annual picnics, one sponsored by a pharmaceutical house and the other by a plant manufacturing electrical parts. The picnics were held for employees, their families, and guests. Both picnics were held on hot, humid days. In both instances, some of the food was prepared in small local bakeries. Evidence indicates that the same type of contaminated food was responsible for both epidemics. Essentially the same inadequacies in food-preparation techniques were common to the two picnics.

Investigations of the two outbreaks were conducted by personnel of the Indiana State Board of Health jointly with local health department officials. Excellent assistance was given by the

management of the two sponsoring firms, making it possible to interview more individuals than would have been accomplished otherwise.

Outbreak of August 15

The pharmaceutical house picnic was held on a privately owned picnic ground, about 60 miles from the plant in the northeastern part of the State. Of the approximate 1,700 persons who attended, about 1,000 became ill following the meal, an attack rate of 58.8 percent. Information was obtained from 966 individuals (630 patients and 336 not affected) through the use of a standard form used by the Indiana State Board of Health personnel to investigate foodborne outbreaks. The plant management distributed the questionnaires to employees, who provided the information desired. This cooperation contributed significantly to obtaining the epidemiologic information necessary for this investigation.

The picnic menu consisted of baked beans, barbecued chicken, ham sandwiches, potato salad, pickles, olives, coffee, milk, soft drinks, and cake. Food service started about 11:30 a.m. and continued for several hours. The occurrence of illnesses by the time of onset of symptoms during the afternoon and evening following the picnic meal is shown in figure 1. The epidemic curve indicates that the outbreak began as early as 1 p.m., reached maximum intensity from 3 to 4:30 p.m., and ended by 9 p.m. Although a few individuals became ill after 9 p.m., the impact of the outbreak occurred within an 8-hour period.

The rapid onslaught of the outbreak imme-

The authors are with the Indiana State Board of Health. Dr. Googins is State epidemiologist; Mr. Collins is survey officer, retail food section, food and drug division; Dr. Marshall is director, communicable disease control division, and Dr. Offutt is State health commissioner.

diately affected the county in which the picnic was held. The two hospitals in the county, with a combined total of 79 beds, were quickly swamped with patients seeking emergency treatment. Most of the 13 doctors within the county were consulted. A local armory and a high school were used to provide emergency treatment for those not admitted to the hospitals. The State police and the sheriff's department aided in the evacuation of the patients from the picnic ground to the local treatment centers. Many persons had left the picnic site and were returning home by private automobile when stricken. Constant radio announcements cautioned individuals to pull off the road in case of illness. Aid to such individuals was given by State police. In spite of the size of this outbreak and the problems it posed, the citizens of the county, the officials, and the medical personnel handled the situation very well.

Among the 630 patients who were interviewed, vomiting, diarrhea, abdominal pain, and nausea occurred most frequently (table 1). The illness lasted less than 24 hours in the majority of the patients. Most of the patients were treated symptomatically and released from the treatment centers. Five individuals were in severe shock and were given intravenous fluids during their treatment. It was reported that a woman early in the third trimester of pregnancy began labor pains during the course of her illness. However, she did not deliver. All hospitalized patients were released by the end

Table 1. Frequency of symptoms reported by 630 picnickers, gastroenteritis outbreak, August 15, 1959

Symptom	Number	Percent
Vomiting.....	594	94.3
Diarrhea.....	529	83.9
Abdominal pain.....	479	76.0
Nausea.....	466	73.9
Moist skin.....	378	60.0
Muscle soreness and cramps.....	272	43.2
Chills.....	252	40.0
Prostration.....	214	33.9
Fever.....	159	25.2
Disturbed vision.....	120	19.2
Metallic taste.....	74	11.7
Convulsions.....	11	1.7

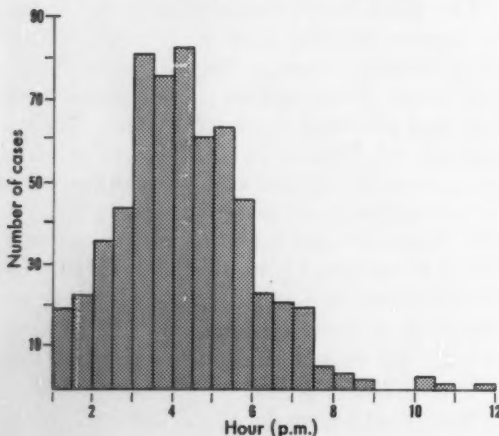
of 24 hours with the exception of two known cardiac patients.

The time which elapsed between eating the meal and the onset of symptoms is shown in figure 2. The median incubation period was $3\frac{1}{2}$ to 4 hours. The incubation periods for the 630 patients interviewed ranged from one-half hour to 30 hours. Approximately equal numbers of males and females were affected at each age level (table 2). Because age and sex information was not recorded for approximately 700 of the picnickers, attack rates cannot be determined accurately.

Attack rates were determined for each food item served (table 3). The ham sandwich was the only food served which produced a substantial difference in attack rates between those who had eaten it (75.6 percent), and those who did not (20.4 percent). Attack rates for all other food items served were not significantly different for the two groups. Thus, it was evident that individuals who ate the ham sandwiches were exposed to a greater risk of food poisoning than were those who did not eat the sandwiches.

Prompt action by the local health department sanitarian in obtaining food samples facilitated study by providing laboratory specimens for later analysis. Samples of the sliced ham and barbecued chicken, still in the original serving containers, were taken to a nearby locker plant and frozen. Because samples of the other foods were not available in their original containers, portions of the potato salad, baked beans, relishes, and cake were re-

Figure 1. Onset of symptoms in 630 picnickers, gastroenteritis outbreak, August 15, 1959



moved from serving plates and transferred to the locker plant. Samples of milk, soft drinks, and hamburgers which were available from a concession stand, as well as several samples of the drinking water, were collected.

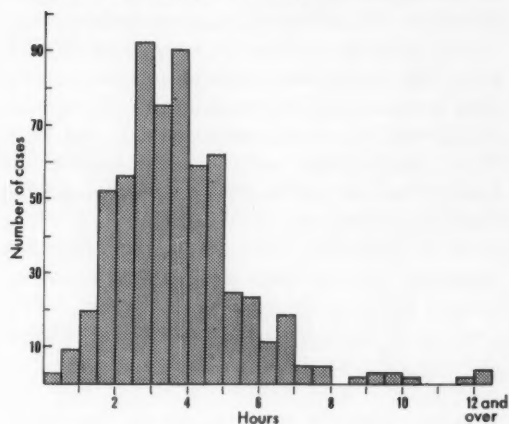
All the food samples, analyzed bacteriologically at the Indiana State Board of Health laboratory, were negative for the *Salmonella-Shigella* group of organisms. The positive findings are summarized in table 4. The coagulase-positive staphylococci isolated from samples of ham, barbecued chicken, and potato salad were phage typed. An identical phage type, 6-47-53-VA₄, was found from each source. A culture of staphylococcus isolated from the ham was sent to the Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio, for the cat injection test for enterotoxin production. Four cats injected with a filtrate prepared from the culture exhibited vomiting within 30 minutes to 3 hours after injection. This is characteristic of the response of adult cats to known enterotoxic filtrates.

The sources and manner of preparation of all foods served at the picnic were investigated. However, since epidemiologic and laboratory evidence incriminated the ham as the transmission vehicle, this report is limited to a discussion of the ham. All food except the barbecued chicken, milk, coffee, and soft drinks was prepared by a family owned and operated, small

Table 2. Age and sex distribution among 630 picnickers affected, gastroenteritis outbreak, August 15, 1959

Age	Male	Female	Total
1-5	15	14	29
6-10	24	27	51
11-15	27	24	51
16-20	21	24	45
21-25	22	19	41
26-30	29	25	54
31-35	30	26	56
36-40	39	30	69
41-45	36	26	62
46-50	37	25	62
51-55	17	19	36
56-60	19	12	31
61-65	5	9	14
66 and over	13	11	24
Unknown	0	5	5
Total	334	296	630

Figure 2. Time between eating meal and onset of symptoms in 630 picnickers, gastroenteritis outbreak, August 15, 1959



neighborhood bakery. In addition to producing the usual bakery products, the bakery provides a catering service for weddings, parties, and picnics. The shop was found adequate in cleanliness and equipment for operation as a bakery. However, it was felt that any large volume of food preparation, such as for catering, would overload the equipment and workspace. Specifically, there appeared to be a lack of adequate refrigerated storage facilities for the large volume of perishable food necessary in conducting a catering operation. Much of the equipment did not appear large enough to permit volume preparation without excessive handling of food by employees.

The bakery personnel began to prepare for the Saturday picnic 4 days in advance. On Tuesday, August 11, 30 canned hams, averaging 13 pounds each and properly labeled regarding storage, were delivered under refrigeration to the bakery. These were stored in an unrefrigerated back room until Thursday. On Thursday, the cans were opened at 1:30 p.m., and the hams prepared for baking by removing the excess gelatin, scoring them, and adding spices. The hams were then encased in a shell of rye dough and placed in the oven at 350° F. at 3 p.m. After they were baked for 3 hours, the hams were set out to cool. The bakery manager removed the dough from the baked hams at 10 p.m. that evening, covered the hams with waxed paper, and stored them in the unrefrig-

erated back room. On Friday, six part-time employees helped with the preparation. Two of the employees began to slice the ham in the morning and completed the operation about 3 p.m. The hams were sliced on a small, old, and difficult-to-clean machine, and the slices were stacked on edge in enameled roasting pans which, when filled, contained about 25 pounds of tightly packed ham each. As each roaster was filled, it was stored in the unrefrigerated back room of the bakery.

At 4 p.m. on Friday, a cold-plate truck equipped with an electrical compressor refrigeration unit was brought to the bakery. This truck unit operated only when connected to an outside 110-volt circuit. The ham and other picnic food were loaded into the truck for storage overnight. According to the bakery operator, the truck's refrigerator unit was

operating from 4 p.m. Friday until 5 a.m. Saturday.

At 6:15 a.m. Saturday, the ham and other food were transferred from the cold-plate truck to a nonrefrigerated, aluminum-paneled truck which was sent from the pharmaceutical firm. The truck was then driven to the picnic site, some 60 miles away, where it was unloaded about 8:30 a.m. Employees prepared ham sandwiches until 11:30 a.m. The assembled sandwiches were not refrigerated.

Investigation did not reveal the source of contamination of the ham. No illness or skin lesions were detected among the bakery employees. That conditions for the subsequent multiplication of the contaminating staphylococci were good is obvious. There was no proper refrigeration of the ham from the time of its delivery to the bakery on Tuesday until

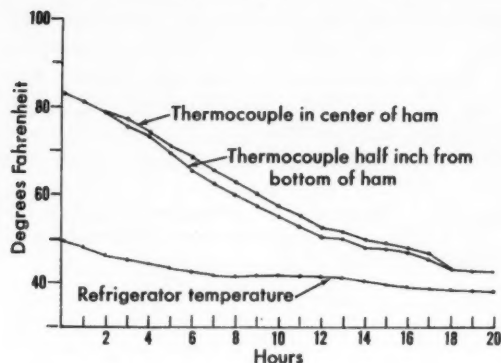
Table 3. Gastroenteritis attack rates per 100, by type of food eaten by 966 picnickers, August 15, 1959

Menu item	Did eat				Did not eat			
	Total	Ill	Not ill	Attack rate	Total	Ill	Not ill	Attack rate
Baked beans.....	577	391	186	67.8	389	239	150	61.4
Barbecued chicken.....	836	539	297	64.5	130	91	39	70.0
Cake.....	600	385	215	64.2	366	245	121	66.9
Coffee.....	249	170	79	68.3	717	460	257	64.1
Ham sandwich.....	784	593	191	75.6	182	37	145	20.4
Milk.....	106	70	36	66.0	860	560	300	65.1
Soft drink.....	303	173	130	57.1	663	457	206	69.1
Pickles and olives.....	497	321	176	64.6	469	309	160	65.8
Potato salad.....	791	522	269	66.0	175	108	67	66.1

Table 4. Results of bacteriological analysis of food served at picnic, gastroenteritis outbreak, August 15, 1959

Food sample	Total plate count per gram	Streak plate	Organisms isolated	Estimated number of organisms isolated per gram
Ham (2 samples):				
No. 1.....	6.8 billion	-----	<i>Staphylococcus aureus</i> (coagulase positive).	>100,000,000
No. 2.....	>290,000,000	-----	<i>Staphylococcus aureus</i> (coagulase positive).	>1,000,000
Barbecued chicken.....	340	-----	<i>Staphylococcus aureus</i> (coagulase positive).	Few only
Potato salad.....	108,000	-----	<i>Staphylococcus aureus</i> (coagulase positive).	1,000
Baked beans.....	-----	Slight growth	No pathogens.....	-----
Pickles.....	-----	No growth	-----	-----
Hamburger.....	-----	Slight growth	No pathogens.....	-----
Cake.....	-----	Slight growth	No pathogens.....	-----

Figure 3. Temperature reduction from room temperature (82° F.) of three 9–10 pound baked hams sliced and stored in refrigerator which had initial temperature of 38° F.



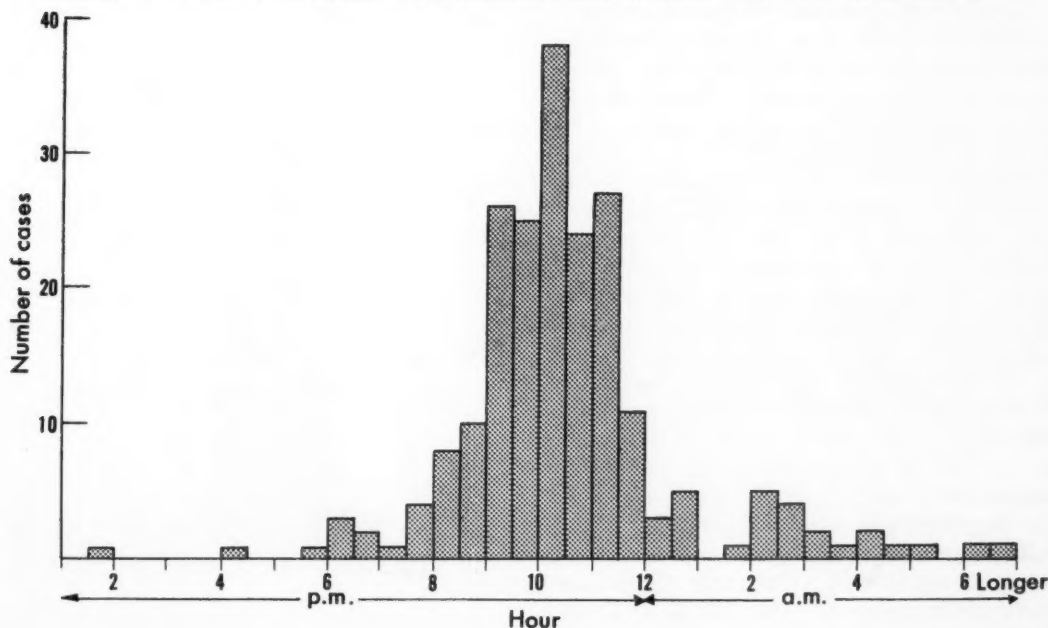
it was served on Saturday. Although the ham was placed in a refrigerated truck overnight on Friday, it is doubtful that the sliced, tightly packed ham was cooled to a point which would inhibit bacterial growth. Experiments conducted by laboratory personnel of the pharmaceutical house, using thermocouples placed near the bottom and in the middle of baked, sliced hams, indicated that a refrigerator at 38° F.

would reduce the temperature of ham from room temperature (82° F.) to 50° F. in approximately 13½ hours (fig. 3.) The hams used for the experiment were about 3 pounds lighter in weight than were those prepared for the picnic. The approximate temperature of the cold-plate truck at the time the hams and other food items were placed in it at the bakery on Friday evening at 4 p.m. was 60° F. Thus, in view of the 13½ hours required to lower the temperature to 50° F., as indicated by the experiment, it is doubtful that the hams reached this temperature by the following morning.

Outbreak of August 22

On Saturday, August 22, 1 week after the outbreak described above, a picnic was held for employees, their families, and guests by a firm which manufactures electrical parts. Having heard of the outbreak of the previous week, the chairman of the firm's board of directors requested the picnic committee to take every precaution to prevent a similar occurrence. The picnic committee responded by deciding to use ice to chill the salads to be served. Unfortunately, precautions were not established relative to other foods served.

Figure 4. Onset of symptoms in 216 picnickers, gastroenteritis outbreak, August 22, 1959



The picnic was held in a park adjacent to the plant. The day was humid and hot, with a temperature over 90° F. Records kept by the company indicated that 1,813 individuals attended the picnic. Data obtained from 896 picnickers, by personal interview and the board of health's questionnaire, revealed that at least 216 of them had been affected, an attack rate of 11.8 percent.

Food service began at 4:30 p.m. and continued until 6:30 p.m. The menu consisted of baked ham sandwiches, macaroni salad and potato salad, cottage cheese, baked beans, scalloped corn, cole slaw, barbecued hamburger, sliced fresh cucumbers in vinegar, individual portions of ice cream, cakes, soft drinks, beer, and coffee. The number of people affected after the picnic meal was undetermined because of the ever-increasing number of persons who had become ill (fig. 4). The crest of the epidemic curve was reached at 10-10:30 p.m. and although it had subsided considerably by midnight, illnesses continued to occur throughout the early morning hours of the following day. The epidemic curve also indicates that several individuals became ill prior to the time food service began. These persons had assisted in the food preparation and had sampled some of the food earlier in the afternoon.

Approximately one-half of the affected persons needed medical care. Many of the patients were seen by the plant physician at the shelter house on the picnic ground. Approximately 60 persons received emergency treatment at hospitals in neighboring cities, and an indefinite number went to physicians of their choice.

The most frequently mentioned symptoms were abdominal pain, vomiting, nausea, and diarrhea (table 5). The duration of illness was 12 hours or less for 87.5 percent of the patients. The remainder either did not indicate the duration or had illnesses lasting more than 24 hours.

The median time lapse between eating the meal and onset of symptoms for this outbreak was 4½-5 hours. The bulk of the incubation periods fell within 3-6 hours (fig. 5). There were a few excessively long incubation periods, the longest being 24 hours.

The attack rates for each item on the menu are shown in table 6. The greatest difference in attack rates between those who ate a specific

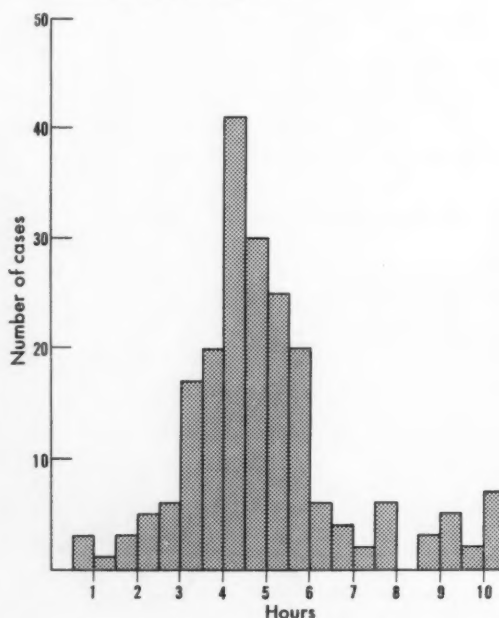
food and those who did not occurred with the ham sandwich. This finding, together with several instances in which individuals were known to have been ill after eating ham alone, was presumptive epidemiologic evidence that ham was once again the offending vehicle.

When it became evident that an outbreak was occurring, the factory management contacted the Indiana State Board of Health which advised them to refrigerate the food served for

Table 5. Frequency of symptoms reported by 216 picnickers, gastroenteritis outbreak, August 22, 1959

Symptom	Number	Percent
Abdominal pain.....	149	68.9
Vomiting.....	146	67.5
Nausea.....	102	47.2
Diarrhea.....	95	43.9
Moist skin.....	72	33.3
Fever.....	67	31.0
Chills.....	62	28.2
Muscle soreness and cramps.....	51	23.6
Metallic taste.....	39	18.0
Prostration.....	30	13.8
Disturbed vision.....	23	10.6
Convulsions.....	0	0

Figure 5. Time between eating meal and onset of symptoms in 216 picnickers, gastroenteritis outbreak, August 22, 1959



subsequent sampling. Bacteriological analysis of specimens of ham, barbecued hamburger meat, potato salad, macaroni salad, scalloped corn, cottage cheese, and cake was made by the board of health laboratory. The findings are summarized in table 7. The *Staphylococcus*

aureus cultures isolated from the ham and potato salad were phage typed by the laboratory and the Communicable Disease Center, Public Health Service, Atlanta, Ga. The cultures were found to be phage type 7 when concentrated phage suspensions were employed. A

Table 6. Gastroenteritis attack rates per 100, by type of food eaten by 896 picnickers, outbreak of August 22, 1959

Menu item	Did eat				Did not eat			
	Total	Ill	Not ill	Attack rate	Total	Ill	Not ill	Attack rate
Baked beans.....	398	85	313	21.3	498	131	367	26.3
Barbecued hamburger.....	476	89	387	18.7	420	127	293	30.2
Beer.....	25	6	19	24.0	871	210	661	24.1
Cake.....	397	82	315	20.6	499	134	365	26.6
Coffee.....	130	38	92	29.2	766	178	588	23.2
Cole slaw.....	196	45	151	23.4	700	171	529	24.4
Cottage cheese.....	111	25	86	22.5	785	191	594	24.3
Cucumbers.....	56	14	42	25.0	840	202	638	24.0
Ham sandwich.....	476	189	287	39.9	420	27	393	6.4
Ice cream.....	535	134	401	25.0	361	82	279	22.4
Macaroni salad.....	217	59	158	27.2	679	157	522	23.1
Soft drink.....	320	79	241	24.7	576	137	439	23.8
Potato salad.....	346	87	259	25.1	550	129	421	23.4
Scalloped corn.....	238	66	172	27.7	658	150	508	22.8

Table 7. Results of bacteriological analysis of food served at picnic, gastroenteritis outbreak, August 22, 1959

Food sample	Total plate count per gram	Streak plate	Organisms isolated	Estimated number of organisms isolated per gram
Ham (5 samples):				
No. 1.....	>300,000,000	-----	<i>Staphylococcus aureus</i> (coagulase positive). <i>Streptococcus faecalis</i> <i>Proteus mirabilis</i>	>1,000,000 >1,000,000 >1,000,000
No. 2.....	>196,000,000	-----	<i>Staphylococcus aureus</i> (coagulase positive). <i>Streptococcus faecalis</i> <i>Staphylococcus aureus</i> (coagulase positive).	>1,000,000 >1,000,000 >900,000
No. 3.....	>370,000,000	-----	<i>Streptococcus faecalis</i> <i>Staphylococcus aureus</i> (coagulase positive). <i>Streptococcus faecalis</i> <i>Proteus morgani</i>	>1,000,000 >1,000,000 >1,000,000 >1,000,000
No. 4.....	>300,000,000	-----	<i>Staphylococcus aureus</i> (coagulase positive). <i>Streptococcus faecalis</i> <i>Proteus morgani</i> <i>Staphylococcus aureus</i> (coagulase positive). <i>Streptococcus faecalis</i> <i>Proteus morgani</i>	>1,000,000 >1,000,000 >1,000,000 >1,000,000 >1,000,000 >1,000,000
No. 5.....	>300,000,000	-----	<i>Staphylococcus aureus</i> (coagulase positive). <i>Streptococcus faecalis</i> <i>Proteus morgani</i> <i>Staphylococcus aureus</i> (coagulase positive).	>1,000,000 >1,000,000 >1,000,000 Few only
Potato salad.....	105,000	-----	<i>Staphylococcus aureus</i> (coagulase positive). No pathogens.....	Few only
Macaroni salad.....	790,000	Slight growth.....	No pathogens.....	
Barbecued hamburger.....	-----	Growth.....	No pathogens.....	
Scalloped corn.....	-----	Growth.....	<i>Streptococcus faecalis</i>	Few only
Cottage cheese.....	-----	Growth.....	No pathogens.....	
Cake.....	-----	Growth.....	No pathogens.....	

culture of *S. aureus* isolated from the vomitus of one of the patients was also phage type 7.

Cultures of *S. aureus*, coagulase positive, isolated from ham and from vomitus were submitted to the Robert A. Taft Sanitary Engineering Center for cat injection tests. No response was observed in cats injected with filtrates prepared from these isolates. However, as indicated by laboratory personnel at the center, a negative result is less meaningful than a positive one. Basing the test on a culture grown from a single isolated colony is not always satisfactory. Negative cat tests have been observed on culture filtrates produced from a single-colony inoculum of a strain known to be enterotoxigenic. There is also the possibility that a staphylococcus strain may produce enterotoxin in certain foodstuffs, but not in the casein hydrolysate broth which was used for these tests.

The source, manner of preparation, and handling of all food items served at the picnic were investigated. Only those items which laboratory evidence indicated were grossly contaminated are discussed below.

The ham, subsequently made into sandwiches, was obtained from two local grocery stores. Twenty smoked hams of "bone in" type were delivered, under refrigeration, to a local bakery on Thursday, August 20, between 9 a.m. and 1 p.m. The hams were all large, varying between 22 and 26 pounds in weight. They were stored in their original containers, unrefrigerated, until Friday evening at approximately 8 p.m. when they were baked during the night. When baked, the hams were stored in pans until cooled and then boxed. The complete baking operation was finished by 8:15 a.m. Saturday.

At approximately 9 a.m. Saturday, the boxes of baked ham were picked up and delivered to the plant cafeteria. At the cafeteria, the picnic chairman and another employee cut the hams into four quarters and boned them, and one employee sliced the quarters on a small machine. This operation took from about 9:30 a.m. until noon. As the quarters were sliced, the individual slices were stacked by hand into flat shallow pans, which were then placed in two reach-in refrigerators for temporary storage.

Between 12:30 p.m. and 2 p.m. members of the picnic committee assembled ham sandwiches. The pans of ham were placed on the cafeteria serving counter and three or four persons working around each pan inserted the meat slices in the buns by hand. It was reported that approximately 1,200 sandwiches were made in the plant cafeteria, placed in layers separated by wax paper, and stored in metal bread containers and in cardboard bun boxes on the floor of the cafeteria, pending removal to the picnic. It was not established that the sandwiches were refrigerated at any time during preparation, storage, transportation, or serving.

The potato and the macaroni salads were made in the plant cafeteria on Saturday morning by members of the picnic committee. It is significant that both of these salads were made by mixing the ingredients by hand. After the salads were made, they were packed into large, clean plastic containers, which were set in tubs of ice water and stored outside the back door of the cafeteria. To make certain that all parts of the salad in the containers were adequately cooled, a member of the food committee periodically inserted his hand and arm into the salad and stirred it. All the foods prepared at the plant cafeteria were delivered to the picnic grounds by truck at approximately 3 p.m. on Saturday.

An inspection of both the bakery and the plant cafeteria was conducted by sanitarians of the Indiana State Board of Health, who found that the sanitation of the small retail bakery was below standard. The building was not rodent proof, and several lots of insect-infested flour stock were condemned and destroyed during the inspection. The work area was generally untidy as exemplified by cracked and dirty worktable tops, wooden floors with open seams and cracks, plaster falling from the walls, and stacks of unused equipment cluttering the premises. It was the opinion of the investigators that, while the equipment in the bakery was quantitatively adequate for the normal load for bakery products, it was probably inadequate for preparation and storage of large volumes of perishable foods.

There was no evidence of gross unsanitary conditions present in the plant cafeteria at the

time of the inspection. The equipment and facilities were, in the opinion of the board of health sanitarians, adequate for the preparation and serving of the number of meals per shift indicated by the number of employees of the plant. Here again it was apparent that this food service facility may not have been adequately equipped to safely prepare the large volume of food needed for this picnic.

Discussion

The clinical and epidemiologic features of the two reported outbreaks, together with the laboratory findings, indicate that staphylococcal enterotoxin was responsible for producing the illnesses. The laboratory finding of significant contamination of the hams by pathogenic staphylococci plus the demonstration of increased risk of infection in those who ate the ham designates this food item as being the common contaminated vehicle in each outbreak. The vomiting exhibited by cats inoculated with filtrates of staphylococcal cultures isolated from hams served at the first picnic indicates that the isolated staphylococcus produced enterotoxin. The negative cat test obtained following injection of staphylococcal filtrates from ham and vomitus isolates from the second picnic does not exclude the possibility that staphylococcus enterotoxin production was actually present.

The investigations of the two outbreaks did not disclose the source of the staphylococci or the manner in which the organisms reached the ham. Examination of the bakery personnel in each instance did not reveal clinical evidence of staphylococcal infection. Nose and throat specimens obtained from the bakery personnel who prepared ham for the first picnic were submitted to the laboratory, but were unsatisfactory for laboratory analysis. It is apparent, however, that optimum conditions of time and temperature prevailed for abundant bacterial growth in the hams between the time of delivery to the bakeries and the time that they were eaten by the picnickers.

Inadequate food-handling practices were demonstrated in both outbreaks. In both, food was prepared in large quantities in facilities not designed for quantity food preparation.

The two bakeries and the plant cafeteria were adequately equipped for normal operations but not for the preparation of the large volumes of food required for the picnics. The outstanding equipment deficiencies noted were inadequate refrigeration space, small slicing machines which were difficult to clean, and inadequate work and storage space. The cold-plate truck used for the first picnic did not provide the proper degree of refrigeration. The refrigeration compartment of a cold-plate truck should be lowered to the refrigerating temperature and then loaded with prechilled food. This type truck is totally inadequate to refrigerate warm food over a short period of time.

In addition to the factors of inadequacy and misuse of equipment, there appeared to be a lack of understanding and practice of safe food-handling procedures on the part of the foodhandlers; for example, the importance and techniques of refrigeration. Although the hams were delivered to the two bakeries under refrigeration, they were held at room temperature for approximately 48 hours in one bakery and 36 hours in the other prior to being baked. The attempt to refrigerate the ham slices was probably nullified by the tightly packed layers of warm ham that were placed in the refrigerator. Furthermore, no refrigeration facilities were provided for the assembled ham sandwiches. There were two examples which demonstrated that the foodhandlers did not understand the necessity of avoiding excessive hand contact with the food.

The two outbreaks constituted public health catastrophes in the areas where they occurred. The outbreak of August 15 is especially noteworthy from the standpoint of the number of people affected, approximately 1,000. Dr. G. M. Dack, director, Food Research Institute, University of Chicago, has commented in a personal communication that he is unfamiliar with any reported outbreaks of this type among the civilian population in which more persons were made ill.

Summary

Two large outbreaks of food poisoning occurred among persons attending picnics in

Indiana on August 15 and August 22, 1959. Approximately 1,000 persons were affected in the first epidemic and 216 in the second.

Clinical, epidemiologic, and laboratory investigations incriminated staphylococcal enterotoxin as the cause of the outbreaks. Sliced ham served in sandwiches at both picnics proved to be the common contaminated vehicle. *Staphylococcus aureus*, phage type 6-47-53-

VA₄, was isolated from the ham in the first epidemic and phage type 7 in the second.

The use of facilities which were inadequate for preparing and storing large quantities of food was significant in both outbreaks. Also, in both instances, there were serious violations of food sanitation practices, notably a lack of continued refrigeration for the perishable foods served at the picnics.

Influenza Vaccination Recommended

Dr. Luther L. Terry, Surgeon General of the Public Health Service, has recommended immediate influenza vaccinations for persons with heart disease, pulmonary disease, diabetes, and other chronic illness; for persons over 65 years of age, and for pregnant women. These groups accounted for most of the 86,000 influenza-associated deaths between September 1957 and March 1960.

Outbreaks of Asian influenza have been predicted for this winter on the basis of their previous patterns of occurrence. Influenza A, appearing in cycles of 2 to 3 years, has been dormant since March 1960. Influenza B, with a periodicity of 4 to 6 years, last appeared in 1955.

Both types of influenza were prevalent in other countries in 1960-61, notably in England, where they directly caused 1,000 deaths and indirectly several more thousand. A similar epidemic in England in 1951 reached this country the following year.

The Surgeon General's Advisory Committee recommends for adults an initial dosage of 1.0 cc. (500 cca units) of polyvalent vaccine administered subcutaneously. Persons not previously immunized should also receive, if feasible, a second injection of 1.0 cc. subcu-

taneously approximately 8 weeks later. This second dose will protect a small but significant proportion of persons who do not develop adequate antibodies after the first injection. Persons previously vaccinated should be reinoculated each year with a single booster dose of 1.0 cc. subcutaneously. Vaccination should be administered as soon as practicable after September 1 and no later than January 1.

Use of influenza vaccine is contraindicated for persons with a history of food allergy to eggs or chicken or those who have had a definite allergic reaction, whether urticarial, asthmatic, or anaphylactic, when inoculated with an egg vaccine.

Physicians and health officers are being alerted by the Public Health Service, and State welfare agencies are being urged by the Bureau of Public Assistance to include influenza vaccinations in medical care provided under public assistance. Recommendations on the use of influenza vaccine, prepared by the Surgeon General's Advisory Committee on Influenza, including a detailed listing of chronic conditions vulnerable to influenza complications, are being supplied to private physicians and health officers.

Health Studies of Human Populations

Conference Summary

An increasing number of ecologic studies relating to health and illness and other inquiries into behavior are being based on statistical analyses of human population groups in a community setting. Such studies have been variously referred to as epidemiology, field research, human medical ecology, and (in Great Britain) as research in social medicine.

Poliomyelitis vaccine trials, investigations of the association between smoking and lung cancer and diet and heart disease, and the U.S. National Health Survey represent only a fraction of the ongoing research in public health that depends on study of whole or sample human populations. Methods employed in this type of research while derived from the under-

lying scientific principles common to all investigation—laboratory, clinical, or epidemiologic—have been considerably refined and sharpened in late years.

The Conference on Health Studies of Human Populations held at the Graduate School of Public Health of the University of Pittsburgh, November 13–16, 1960, was a critical phase of a project sponsored by the Human Ecology Study Section of the National Institutes of Health through a Public Health Service grant (RG-6521). As Dean James A. Crabtree said in his opening remarks, the purpose of the project is “to identify certain principles and guidelines applicable to the planning and execution of studies involving human populations that are to be recommended for adoption by the scientific community generally and, more specifically, by the appropriate study sections of the Public Health Service.”

The conference represented an effort to use the experience of veteran investigators to mark the trail for future inquiries. Attended by more than 50 experienced investigators, it followed by 10 years the first conference of its kind, also held in Pittsburgh, to analyze methods of population studies (1).

The conferees, having been reminded by Donald Reid of Bismarck's remark that “Only a

G. St.J. Perrott, former chief of the Public Health Service's Division of Public Health Methods, was co-chairman of the Conference on Health Studies of Human Populations, with Dr. Edward S. Rogers, professor of public health and medical administration, University of California, Berkeley. Dr. Rogers was also chairman of the Human Ecology Study Section, National Institutes of Health. With Katharine G. Clark, they will be co-editors of the final conference report.

fool learns by his own errors," set about appraising the principal uses of studies of populations and their common strengths and weaknesses in the hope of improving the effectiveness of such studies.

Uses of Population Studies

Thomas McKeown, who with Reid contributed British experience to the meeting, emphasized how recently the population study has come to be recognized as a method with its own special functions and set of disciplines. In a review (2) distributed in advance of the sessions, McKeown wrote:

"There is almost general agreement that social medical research is concerned with the application of large-scale methods to the study of human biology, human disease, and medical administration. So considered, it is identified by its methods rather than by its subject.

"The need for this type of inquiry arises because of the special difficulties that beset research in man. In investigation of other living things, advance has resulted mainly from the use of four methods: *pure stock*, which has made it possible in some circumstances to free experimental inquiry of variation attributable to inheritance; *control of environment*, which reduces the number of influences affecting a result; *experiment*, of which the value is self-evident; and *large numbers*, through which we can offset to some extent the difficulties attributable to variation. Because of the complexity of human biology, all four methods would be particularly welcome; in practice the first three are virtually excluded. The only traditional method of the biologist not seriously restricted is recourse to large numbers. It is with this task—the assembling of accurate data derived from representative populations—that social medical research is now widely believed to be concerned. So regarded, it is something more than yet another tool of the investigator. It is the indispensable complement to the traditional methods of laboratory inquiry on experimental animals and clinical observation in man."

NIH Grants

On the first evening of the meeting, a panel reviewed the thinking which led toward systematizing Public Health Service support for

this method of investigation. Following the trail blazing Public Health Service studies at Hagerstown beginning in 1921, and the first National Health Survey of 1935-36, there naturally arose an interest in using research grants authorized for the National Institutes of Health to facilitate such studies. In 1946, it was decided to extend social medical research through studies which did not fall within technical categories such as pathology and hematology. To review applications for grants for such studies, the Public Health Methods Study Section was set up in the Division of Research Grants in 1946 with Lowell J. Reed as its first chairman. The section defined its interests in surveys and field research which would develop new methodology and techniques or obtain vital information of general applicability. Its criteria related to the soundness of the method of investigation, its significance, and its feasibility. Public Health Service policy in financing research did not then provide funds for the physical facilities for research.

The foregoing steps were but precursory to the subsequent growth in both the breadth of concepts and the nature and extent of support now given to research in the health sciences by the program of the National Institutes of Health. Two study sections, the Human Ecology Study Section and the Health Services Study Section, now review projects formerly handled by the Public Health Methods Study Section.

Under whatever name, as each panel discussant pointed out, every study section has had to adopt some criteria for the types of projects suitable for grants and for determining the soundness of design in an individual application. Throughout the conference, discussion of such criteria was highly informed, since a sizable number of the members had served or were currently serving on one or another of these NIH study sections or on special grant review committees, as well as being investigators in their own right.

So as to consider real rather than hypothetical types of research applications, conferees were supplied in advance with case histories of some outstanding currently active population studies. Whenever possible, the original grant application for these studies was available for

Affiliations of Conferees Quoted

Lester Breslow, *California Department of Public Health*; Antonio Ciocco and Cecil Sheps, *University of Pittsburgh*; W. G. Cochran and David Rutstein, *Harvard University*; Jerome Cornfield, William H. Stewart, Charles V. Kidd, and Alan Treloar, *Public Health Service*; W. Palmer Dearing, *Group Health Association of America*; Paul Densen, *New York City Department of Health*; William D. Bryant, *Community Studies, Inc., Kansas City, Mo.*

Otis D. Duncan, *University of Chicago*; Jack Elinson, *Columbia University*; Fred Epstein, Thomas Francis, Jr., and Felix Moore, *University of Michigan*; Thomas McKeown, *The Medical School, Edgbaston, Birmingham, England*; Harold Nisselson, *Bureau of the Census*; D. D. Reid, *London School of Hygiene and Tropical Medicine, England*; Edward S. Rogers and Jacob Yerushalmy, *University of California, Berkeley*; Stuart Morrison and Kerr White, *University of North Carolina*.

examination and review; in each case the senior investigator was present at the conference (see conference program, page 960).

Launching the discussions of these case materials—they were referred to constantly in subsequent consideration of methodology—Antonio Ciocco observed that all these projects had sought the answers to one or another of three types of questions:

1. *What is the magnitude of a given health problem?* For example, how many people suffer disability for a given period of time? Or, what are the personnel needs of a given mental hospital?

2. *What are the factors which antecede or are associated with the condition studied?* For example, how does air pollution affect health? Or, what is the familial factor in hypertension and coronary heart disease?

3. *How effective have been the measures used to meet the problem?* For example, what proportion of handicapped persons benefit from a rehabilitation program and how much? Or, does easy availability of physician care reduce the frequency of hospitalization?

The answers to the last two questions often imply long-term observation, particularly if they relate to diseases which are insidious in their development and associated with a multitude of contributing factors. All such inquiries,

Ciocco emphasized, must depend on the combined efforts of laboratory studies, clinical investigations, and population research. He also stressed the need to give weight to both the biological and social elements reflected in the family as a unit in population study.

Methodology of Population Studies

The major part of the conference was devoted to examining and discussing some of the perennial problems of method encountered both by investigators and project review committees. There was, of course, general agreement that in the final analysis productive research always depends not on methods per se but on an imaginative investigator who knows how to use these methods to pursue an idea that is both feasible and important to study. Thus, while a weak methodology can prevent the bringing of a good research idea to fruit, strong methodology can never in itself produce the fruitful idea.

Within this framework, various members of the conference proposed a number of general statements about particular aspects of study design and conduct. For example, Paul Densen suggested that any committee reviewing project grant applications bear the following kinds of questions in mind as they consider an investigator's proposal for collecting the data for his study:

1. *Are the kinds of data to be collected or the measurements to be taken related as closely as is possible to the announced purpose of the study?* Answering this question requires a sharply defined statement of the objectives of the study. Advance sketches of the general types of tables expected at the end of the study provide one way of helping to clarify these objectives, as well as bringing into focus questions of definition and classification.

2. *Does the investigator show a realization of what is already known about the natural history of the disease he is studying—its dynamics in time and space—and is he trying to take this into account in the way he proposes collecting his data?* In many situations, air pollution for example, the effects observed in a population at any given moment may be the results of cumulative exposure over a long period of time. How does the study take this into account?

3. *Are there operational definitions of the disease condition or other study variables, so that it is clear just what the proposed measurements will actually be measuring?* This question applies both to independent and dependent variables. For example, in a study of obesity in relation to coronary disease, what is meant by "obesity" and what is meant by "coronary disease"? Both need to be spelled out.

4. *As part of the study design, are there built-in mechanisms for regular checks on both the reliability and the validity of the measurements to be made?* Plans for duplicating some of the kinds of measurements on a sample of the study group, perhaps using different observers, and plans for independent checks on the accuracy of the data being collected need to be incorporated into the study from its outset.

5. *Can the desired data actually be obtained in the way proposed?* For example, will housewives in a household survey be able to supply complete enough answers to the questions being studied in the project? To what extent may they have forgotten the information, or be reluctant to give it, or simply be not at home when the interviewer calls? Will the people in the sample chosen for a clinical test actually show up to take it? Or, do the records the investigator proposes to analyze actually contain the information he wants from them?

6. *Has the investigator recognized the implicit assumptions underlying the data relative to the stated objective?* To illustrate, studies measuring the quality of medical care usually define "quality" in terms of commonly accepted current standards of practice rather than in terms of the actual benefits accruing to the patients in the study. Such a basic assumption could be misleading—an unconventional treatment, such as penicillin when first introduced, may in fact be the highest quality care.

7. *Does the application show the intent to employ people with the kinds of particular skills needed for this study?* For example, if the study concerns measurement of attitudes, will someone associated with the project have special competence in developing attitudinal scales?

8. *Is there evidence that the project will be adequately supervised in its day-to-day operations?* In applications from hospitals and from

health departments particularly, the person assigned to watch over the research project often turns out to have one or more other kinds of daily operating responsibilities. In such cases it is important to know how the study will be assured its necessary share of attention.

9. *Is there a sufficient allowance of both time and money in the project application for the processes of tabulating the data and analyzing the results?* Failure to budget properly for these phases of a study is one of the most usual sources of later sorrow to the inexperienced investigator and to those who sponsor his project.

The tenor of the conference was such that members rarely expressed flat disagreement with any such guidelines, but devoted their time to analyzing their more subtle implications through a course of tangential questions, such as the following:

How clearly can a study's objectives be defined?

Is a clearly stated hypothesis or a set of precise questions to be answered, while always desirable, always possible? Besides the new type statistician who, in Felix Moore's words, "has the solution to his problem well in hand before he creates a tight foolproof design to prove it," should the old-fashioned shoe-leather epidemiologist "who would like to snoop around a community and use serendipity to uncover something useful" also be given a chance? Discussion of these questions led into talk about the relative value of descriptive observational studies as opposed to experimental or evaluative studies. Has "evaluation," for example, become too fashionable a term?

How best to choose a population for study?

Is it best to draw on a single population, such as is done at Alameda County, Calif., for health studies of many different kinds? (Current research plans at Alameda include studies of drinking practices; reproductive wastage; childhood accidents; coronary heart disease; cancer of the breast and cancer of the uterus; and studies of the population at large—its psychological, sociological, demographic, and environmental characteristics, and how these relate to the development of several diseases.) Or is it better to select several different special populations, such as school children, bus

drivers, or veterans, for each study according to its own particular objectives?

While it was realized, of course, that such contrasts are not necessarily true alternatives, nevertheless throughout the conference sessions this question emerged again and again. Some members set forth the advantages of the first approach; others, particularly the British representatives, favored the latter. Donald Reid dubbed this the "flying squad" approach and described some of the ad hoc studies carried out from the London School of Hygiene and Tropical Medicine, using a variety of populations.

For what types of studies are long-term observations essential?

Or conversely, in what circumstances can repeated cross-sectional observations of a population serve as well as or better than repeated observations of the same individuals over a period of time? While it was agreed that the latter method often has definite theoretical advantages, the conferees recognized that many kinds of difficulties plague the investigator in a longitudinal cohort study. Among these is the central fact that "even the hardest data deteriorate with amazing rapidity"—which led Alan Treloar to observe that in this respect statistics had a lot in common with garbage. Both create pressing problems of disposal.

What kinds of safeguards are useful to maximize validity and reliability of data collected?

Here, Harold Nisselson put in a particularly strong plea for an attitude of perfectionism in the whole area of data collection and analysis, including the initial precise definition of terms of the data to be collected, quality control measures during the collecting process, and use of the variety of techniques that can reduce the reducible sources of error and describe and measure those which are irreducible.

Should the original study design include detailed plans for analysis of data?

Analysis, members of the conference all agreed, is too often done too hurriedly at the end of the study, leaving little time for contemplation of the possibilities the data might yield. As one member stated: "Too often we are confronted with the spectacle of large masses of

data untouched by human thought." Advance formulation of plans for analysis, including skeleton tables, also guards against change in emphasis of the study objectives that may result from staff turnover, particularly in long-term studies. Speaking to this point, William Cochran reminded the conference that the original motto of the Royal Statistical Society emblazoned on an emblem showing a sheaf of wheat, "Let others thrash it out!", has since been abandoned.

Under what conditions is it safe to infer and generalize from the results of a study?

Findings from most studies, even randomized trials, should be regarded quite modestly as approaches to the truth rather than truth itself, conferees agreed. Even in the natural sciences, as Jerome Cornfield reminded the group, the crucial experiment is rare. Findings from both observational and experimental studies have to be looked at with the same critical question: Are there other reasonable hypotheses that could explain these findings—or is this the only one? Along the same lines, conference members discussed whether observations of relationships (for example, cigarette smoking and lung cancer) are likely to be more generalizable from one group or geographic area to another than observations of levels (for example, overall mortality from lung cancer).

How can multidisciplinary research be carried on most advantageously?

Emerging for discussion at several different sessions of the conference, this question brought forth considerable difference of opinion. Should social scientists and statisticians be incorporated into the research team itself or brought in on a consultant basis? Does use of an advisory committee accomplish this purpose? Under what conditions? Can juniors in the various fields be used, or is it best to stick to the most experienced investigators for multidisciplinary activity? Reaction was especially articulate to Thomas McKeown's statement that "the lowest common denominator of communication is when representatives of various disciplines are seated around a table and told to communicate."

Financing Research Through Grants

One session of the conference was devoted almost entirely to discussion of the financing of research. Various members deplored certain results of the present system of project grant financing such as the time consumed in preparing grant applications, pressures to meet fixed

Program

History of the Study Section. W. Palmer Dearing, chairman, Antonio Ciocco, G. St.J. Perrott, Cecil Sheps, Edward S. Rogers, Alan Treloar.

Case Materials:

Public Health Service Studies at Hagerstown, Md. Wm. H. Stewart.

Tecumseh, Mich. Thomas Francis, Jr.

Alameda County, Calif. Lester Breslow.

Arsenal Health District, Pittsburgh, Pa. Antonio Ciocco.

Washington Heights, New York, N.Y. Jack Elinson. Kansas City, Mo. W. D. Bryant.

Public Health Service Studies in Heart Disease, Framingham, Mass. Thomas R. Dawber.

Public Health Service Air Pollution Studies. Richard A. Prindle.

Health Insurance Plan of Greater New York. Sam Shapiro.

Kaiser Foundation Hospitals, Oakland and San Francisco. Jacob Yerushalmy.

University of Chicago Studies. Philip Hauser.

Research in Social Medicine. Thomas McKeown.

Discussion of Case Materials:

Evaluation of Statements of Objectives. Alan Treloar, Antonio Ciocco.

Suitability of Population Selected for Study in Relation to Objectives. W. G. Cochran, Paul Densen, Otis Duncan, Jacob Yerushalmy.

Study Design in Relation to Objectives. Felix Moore, Sidney Cobb, Donovan J. Thompson, David Rutstein.

Methods of Data Collection and Analysis. Theodore Woolsey, Fred Epstein, Harold Nisselson, Jack Elinson.

Staffing, Administration, and Costs. Kerr White, Charles V. Kidd.

Types of Population Research Centers: The Epidemiological Study Area. Thomas Francis, Jr.; The Flying Squad Survey Team. D. D. Reid. Discussants: W. D. Bryant, Thomas McKeown, Stuart Morrison.

Summary and Conclusions:

Types of Inquiries in Population Studies. Antonio Ciocco.

Problems of Data Collection. Paul Densen.

Inferences and Generalizations. Jerome Cornfield.

Advantages and Disadvantages of Various Types of Population Research Centers. Jack Elinson.

time schedules with resulting tendencies toward premature publication, shopping for personnel, or the neglect of other long-term objectives. Kerr White described the method of long-term support of Great Britain's five or six major population research centers. National funds come from the Medical Research Council or the University Grants Committee either directly to independent centers or indirectly through university departments of social (preventive) medicine. Dr. White felt that this system encourages both continuity of staff and flexibility of operations undertaken by the research units.

As a strategy for allocating funds, Thomas McKeown suggested that there might be several stages or grades of grants for research: First, deliberately chosen as a risk, investment of a portion of each budget in bright "innocents," whose ideas seem interesting and who need a chance to cut their teeth on a hard task; second, the largest investment in ad hoc projects chosen judiciously on the basis of intrinsic merit of the design or need for information, and under guidance of seasoned investigators in such manner as to assure continuity of staff; and third, considerable funds invested in projects requiring more expensive and elaborate methods, which are associated with fixed populations and observations over a long period—allocated only to proved investigators who have demonstrated the need for further investment through economical ad hoc procedures.

Charles Kidd reported on the new NIH research grant programs: institutional support, research professorships (research career posts), broad program grants, and financing of research centers. Representing a basic departure from the project system, these new programs are "designed to create a stimulating enduring environment for research, rather than the research itself." While research centers are at present restricted to clinical research centers, there are possibilities for expansion in a number of directions.

Conclusion

Throughout all the discussions, the conferees kept returning to a central thesis that population research techniques, like laboratory tech-

niques, are useful only as the investigator tailors them to help him solve the particular problem at hand. Within this general context, using various suggested guidelines or discussion questions as springboards and the experience of actual research projects as case examples, conference discussion centered around topics such as choice of population, problems of study design and data analysis, administration, and financing. These discussions, from which only a few highlights have been sug-

gested in this paper, will constitute the main body of the full conference report to be published in the near future.

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- (1) U.S. Public Health Service and the University of Pittsburgh: Methods in public health research. Proceedings of a conference. *Am. J. Pub. Health* 41: 1-117, August 1951, pt. 2.
- (2) McKeown, Thomas: Social medicine. *Brit. Encycl. Med. Pract.* Butterworths, London, 1960. Medical Progress 1960: 267-282.

Evaluation of Case Histories

(Staff memorandum distributed to discussion leaders prior to conference.)

In evaluating the case histories of current population studies, you may wish to consider some of the following points.

Objectives. What are some guidelines for evaluating the statement of objectives? What is lacking in the case materials that a study group needs? How completely can objectives of population research centers be set out in advance? Is it always possible or desirable that objectives be spelled out in advance?

Suitability of Population Selected. Can generalizations be inferred from the results of the populations selected in the proposals? Can some general principles be specified as to the types of information which are likely to be generalizable, such as biological information, and the types less likely to be generalizable from one population group to another, such as economic information? Are relationships, such as socioeconomic status versus illness rates, more likely to be generalizable than the absolute magnitude of rates?

When is it more appropriate to select a population, such as a group of employees or members of a health insurance plan, and when is a general population needed? Is it possible to lay down some guidelines as to when sampling of a large universe, such as the United States, is necessary, and when results from a more limited population, such as a community, are satisfactory?

Staff and Administration. Is there provision for continuity of staff? Is timing realistic? Is there provision for enough statistical assistance? Will the project have sufficient support from the parent organization? Discuss intracommunity relationships and administration. Does there seem to be sufficient provision for completing analysis and preparing reports for publication?

Types of Study Facilities. What are the advantages and disadvantages of the various types of population study facilities, ranging from what has been called the human population laboratory to what D. D. Reid has termed the "flying squad survey team"?

Which objectives require a "population laboratory"

and which can be carried out equally effectively by a population study center using a variety of populations for its studies? Can some general guidelines be developed on this point?

Do the populations selected have enough range of variation? What are some of the special safeguards necessary in selecting a population to be followed in a long-term study? Under what circumstances must the family rather than the individual be preferred as the basic unit of study? When is a representative sample essential?

What types of study objectives are best met by other types of sampling design?

Appropriateness of Study Design. Which of the study objectives could be fulfilled only by long-term studies—cross-sectional or longitudinal? Which by short-term or current studies?

Which kinds of study objectives permit or require observation of events as they occur in nature, compared with random assignment to "treatment" and "control" groups?

May control of relevant factors significantly limit generalization to natural conditions?

Definitions, Data Collection, and Analysis. How do study materials demonstrate the importance of satisfactory definitions of specific factors to be measured?

Under what circumstances is collection by interview or questionnaire satisfactory? Can one build in safeguards against response or nonresponse error? How does percentage of response affect generalizability of results? When should one use existing records in hospitals, physicians' offices, health and welfare agencies? Examination techniques? Combinations? What concepts of morbidity are implied by these various methods? What errors of measurement are likely to be involved?

To what extent are plans for data analysis laid in the original design of the study? In view of the objectives, will elaborate cross-classifications be necessary? Should these be predetermined to insure that there will be large enough numbers in the population group?

Chronology

September 1946. Public Health Methods Study Section met for the first time.

February 1948. Special committee appointed by National Advisory Health Council considered appropriateness of "Public Health Methods" as title for that section. Suggested dropping "Methods" from title.

June 1948. Title amended to "Public Health Study Section" by National Advisory Health Council.

May 1950. Conference on Methods in Public Health Research, Pittsburgh, Pa., presented first attempt at group analysis of methods of population studies.

May 1953. Reported that in reorganization of study sections of Division of Research Grants, National Institutes of Health, it had been decided to merge the Public Health Study Section and the Environmental Health Study Section under the title "Public Health and Sanitation Study Section." Took effect September 1953.

May 1955. Division of Research Grants decision to abolish the Public Health and Sanitation Study Section and to divide it into two sections, one to be known as the Sanitary Engineering and Occupational Health Study Section and the other as the Public Health and Nursing Study Section. The Public Health and Nursing Study Section inherited the area of technical responsibility and program originally assigned to the Public Health Methods Study Section. (September 1955 minutes.)

January 1957. Public Health and Nursing Study Section separated into Public Health Research Study Section and Nursing Research Study Section. Action taken in response to recommendations to set up a definitive Public Health Research Study Section emanating from State and Territorial Health Officers and others interested in public health research. Action entailed identification of nursing research interests as separate unit.

September 1960. At the end of 1959 there were 10 study sections in the Health Research Services Group of the Research Grants Review Branch, Division of Research Grants. These fell into three categories: public health research, behavioral sciences, and other. Study sections within public health research were Public Health Research, Hospital Facilities Research, Nursing Research, Toxicology, and Sanitary Engineering and Occupational Health. Through administrative action taken in the spring of 1960, the Public Health Study Section was reorganized. With effect from September 1, 1960, the Public Health Research Study Section became the Human Ecology Study Section, with primary responsibility for nonoperational research in a community setting and responsibility for the review of research grant applications in the areas of:

1. "Anatomy" of the community—demography.
2. "Physiology" of the community, the forces that regulate the composition of the community and the occurrence or lack of occurrence of disease—medical ecology.
3. Epidemiology.
4. Research in health sciences relating to social sciences.

At the same time the Hospital Facilities Research Study Section became the Health Services Research Study Section, primarily concerned with operational research in a community setting such as a health department and having responsibility for the review of research grant applications in the areas of:

1. Community health (needs, resources, planning, and practices).
2. Public welfare programs in relation to public health.
3. Health or hospital insurance, or both, in relation to community health.
4. Other related areas.

Conference on Science Manuscripts

The concern by scientists and historians over the loss and dispersion of manuscript sources for the history of science has resulted in the formation of the Conference on Science Manuscripts. This conference is composed of individuals and organizations in the fields of science, history, and documentation. The aims of the conference are cooperation and coordination rather than operation.

The group will stimulate scientists, laboratories, archives, and related organizations to take adequate steps to preserve sources for the history of science. It will encourage the

preparation of a brief manual on what should be saved and how this is to be accomplished. The conference is also encouraging efforts to compile a guide to collections of manuscripts pertaining to pure and applied sciences in the United States, since in order to know what should be saved, knowledge of what has already escaped destruction is necessary.

Inquiries concerning the conference should be sent to its chairman, Nathan Reingold of the Science and Technology Division, Library of Congress, Washington, D.C.

Aspects of the Tecumseh Study

THOMAS FRANCIS, Jr., M.D.

YOUNG investigators must not be led to believe that there are certain strictly confined ways of looking at approaches to experimentation and research. Certainly it seems important to avoid so many scary limitations to starting a study that initiative, ideas, and willingness to proceed are discouraged.

The investigator is asked: Is this approach the most efficient or economical? Is the protocol for continued effort complete? Is there any purpose in beginning if there is population loss? Why collect data that will be worthless in 20 years?

There is not sufficient information and experience in many of the proposed lines of procedure to be sure of best methods. I believe there is ample room for exploration without complete field plans for all future studies.

I doubt if it is worthwhile to make a great effort to achieve mathematical elegance for biological data which are relatively imprecise. Rather we should seek to afford continuity of competent effort, in effect the granting of a license for hunting without fixed boxes.

Tecumseh, Mich., is the scene of a biological community study which has, we believe, some of the basic principles of clinical investigation, of fundamental science, attached to an analysis of health and the growth and development of disorders.

Intuitively—and on experience—I tend to move to the direct approach and direct observation, collecting data of determinable character and noting associations. I wonder if, with some of the restrictions suggested, one would at

present be able to establish the correlation between syphilis and tabes or aneurysm.

The total community satisfies this native impatience. To me, working with people rather than with records as the object of attention is a more profitable basis for observation.

I would first emphasize that the terms "community health study," "epidemiologic community study," or "epidemiologic study area" express the idea that we are concerned not only with the human population but with the surrounding conditions under which health is maintained and pathogenic reactions are occurring.

A community in the epidemiologic sense comprises a human population in its biological, social, and physical environment. The population is in fact an integral component of the community's environment, adjusting in it, altering it, or even creating it, and sharing it with other biological populations. In undertaking to study a total community one should, therefore, adopt the view of the naturalist or the ecologist, seeking to detect, observe, and evaluate the influences at play which affect the associated population in this selected but natural universe.

Since disease is a biological phenomenon arising from maladjustment of man with himself or his environment, the basis of susceptibility and the origins of disorder are best determined by intensive study under the natural conditions of occurrence. I am enough influenced by clinical experience to suggest that careful and maintained observations of limited numbers may lead to recognition of significant relationships as readily as extreme numbers and much data obtained too late to apply to the situation. Moreover these observations on pilot experiments may indicate relationships which can then be studied in other or larger populations.

Dr. Francis is professor and chairman, department of epidemiology, University of Michigan School of Public Health, Ann Arbor. This text is based on remarks offered at the University of Pittsburgh, November 15, 1960.

I stress the terms "natural," "naturalist," and "natural history" to emphasize that one is concerned not only with incidents which have occurred but with those to come. By developing measurements of healthful adequacy and tolerance to stresses or insults at play in the community, the role of stresses in inducing abnormality should be more definitely discernible. The social, physical, and biological factors can be viewed together, or, if you wish, inherent (inherited) and external (environmental) factors can be weighed at the same time. Moreover, the control population is provided simultaneously.

It is doubtful that in our present state of scientific competence all reactions, all effects, and all opportunities can be fully exploited. But it is our belief that with direction of research toward standards of health and the origins of disorder, important advances in concept, methodology, and understanding will be made. In effect the result will be to define the epidemosis, the system of affiliated influences and causal relationships which surround and determine the occurrence of a disorder under natural conditions. I presume this can be considered a form of systems analysis, but it is also experimental epidemiology under natural conditions—a phase of human ecology. It should avoid the distortions which come from rigged experiments or manipulative dissembling of a community. The limited sample of individuals or households appears to assemble an artificial, nonfunctional body of independent persons in contrast to the conditions presented when viewing the community itself as an organic unit.

Dr. Thomas R. Dawber has spoken of his current wish that the total population of Framingham, Mass., had been used for the heart disease study there.

Dr. Jacob Yerushalmy has emphasized how fast a representative sample becomes nonrepresentative. Moreover, he has found that some types of populations are not useful for health studies.

Numerous comments have been made regarding the influence of the community and of the way of life upon the population performance.

What can the study of a total community provide which cannot be gained by cross section

through a larger population? The answer depends upon the objective. If one wishes only to follow the course and outcome of definite cases of disease, the advantage of the total population is nothing. It is probable that designated families and suspects selected by sample can be adequately observed for considerable periods of time. Prevalence and incidence rates of certain diseases can be so determined.

On the other hand, while a cross section may obtain a reasonable sample of members of the human population and of some of their characteristics, it may fail to collect its proper proportion of the community's ecology and of the group environment. It is not clear to me how one can have an adequate sample of a community without extensive mapping of its total constitution. The sample may collect an adequate number of specific items but may not be able to relate them coherently with the population as a whole. In a natural community, horizontal, sagittal, or oblique sections may be made so as to reveal entirely different views of the structure. Moving segmental sections or cohorts can be viewed again under natural conditions.

It is extremely important to make clear, however, that we are not dealing with an either/or choice. A variety of procedures is available for undertakings of different scope and intent. The judgment of the competent investigator must certainly be allowed great freedom in selection of his experimental methods. And I would emphasize again that population studies are experiments to disclose or clarify correlations and should be so viewed. This purpose is to determine health-preserving influences and pathogenic influences residing in or at least operating in the community.

The type of study in which we have engaged at Tecumseh must be considered in various phases. The original basic undertaking is truly ecologic in intent, aimed at describing life and death in a community whose population and environmental constitution has been identified and will be kept under continuous surveillance for alterations which increase health or disorder. It may be viewed in its entirety or as a collection of social or biological or even physical reaction flasks.

The study of cardiovascular and related disorders is but one segment of the general objective. It proposes, after extensive history and medical examination, to give concentrated attention to those families and genetic kindreds in which one or the other syndrome is identified to detect and evaluate the genetic and environmental factors contributing to their incitement.

The advantages of studying the total community for these purposes appear to be:

1. The embracement of entire neighborhoods in juxtaposition to one another so that clustering of cases would be more readily discernible.

2. The continuous observation of comparable kindreds under similar environmental exposure is more readily maintained.

3. The detection and measurement of environmental changes and their effect upon health and pathological reactions can be more easily studied, since they can be more readily applied in a community than to items of a sample.

4. A continuous surveillance of the community of this size at least is more adequately maintainable than a geographic sample of a large population.

5. The effect of "community reactions" on health and disease incidence are more likely to be measurable with respect to factors such as unemployment, elections, exposure to new highways, and epidemics.

6. Since a large body of data will be available regarding the community, a variety of relations can be examined or suspected ones can be tested without requiring separate or numerous ad hoc inquiries of each. Moreover, their validity can be readily checked in the same population or known segments thereof. One may thence develop hypotheses in the course of the study. Speaking of economy, one may ask how many ad hoc studies are equivalent in cost to one integrated study, or in their value to etiological analysis.

7. The entire complex of interrelationships between events, exposures, habits, and disorders can be explored. Similarly, the occurrence of different disorders in the same kindreds or groups may give information of common factors in etiology or response. This does not seem to be so readily approachable in a sample.

8. Since the studies require close integration of epidemiologic and clinical procedures with fundamental laboratory research, the location should permit ready movement of research activities back and forth, from the field to the clinic, to the laboratory, or vice versa, so as to develop methods of investigation and to permit their test under field conditions. Community medical facilities can be more effectively employed in the study of a total population than under sampling conditions.

9. I believe the examination of a population can under these circumstances be done less expensively than the study of a similar sample in a large city.

Two other features need consideration. In an experiment such as ours in a total community, much research must be devoted to establishing standards of healthful competence and to detecting early deviations of preclinical nature. Hence, the study should serve as an advance post in guiding this entire direction of medical research toward prevention of the chronic diseases.

The second aspect relates to the role of such a community study in medical education. There has been a strong active support from clinical and other departments of the University of Michigan. Public health and medical students, as well as faculty members, have the opportunity to participate in the studies. The availability of this total community as a teaching facility may give further impetus to the development of interest in ecology and preventive medicine and to the concept of "physician to the community" as well as to the individual.

Mental Illness

Some three-quarters of a million patients fill our mental hospitals, occupying more than half our hospital beds. A quarter of a million more men, women, and children are admitted every year. All told, mental illness costs this country more than \$1.7 billion each year. It cost over \$850 million in 1959 to run the nation's mental hospitals. . . .

The cost in dollars only introduces the story. In terms of loss of precious human talent, in terms of family misery, in terms of infinite personal tragedy, the cost cannot be measured.

The facts are in. The Joint Commission on Mental Illness and Health, which was authorized by the Congress, took more than 5 years and spent some \$1.5 million to gather them for us. I commend the commission's 10 monographs and its final report, "Action for Mental Health," to you, to the Governors of our States, to members of the Congress and State legislatures, and to all citizens. . . .

These findings startle even persons knowledgeable in the field of mental illness. They show that 80 percent of our 277 State mental hospitals still provide only custodial care for patients; only 20 percent have participated in modern advances designed to make them truly therapeutic. They define the "unfinished business of mental health" in this way: more than half of the patients in most State hospitals receive no active treatment of any kind designed to improve their mental condition. This is so despite the fact that the outlook for the schizophrenic patient, the main tenant of our mental hospitals, can be good under the best treatment conditions. These findings show that many of the patients in State hospitals do not need to be there at all.

Now, what to do? . . . We do not need to start afresh as a Federal Government. The National Institute of Mental Health, in the years from 1950 to 1961, spent a total of \$379 million on the pursuit of new knowledge and the training of much needed personnel.

The Federal Government has also aided in the construction of mental hospitals. Since the start of this program, 131 mental hospitals have been finished or are under construction—at a total cost to the Government of nearly \$50 million. Saint

Elizabeths Hospital and the Veterans Administration—always eager to seek new knowledge and try new ways—have pioneered in mental hospital care.

No, we do not need to start afresh. But we do need a fresh approach. I like the approach the Joint Commission offers to us. . . .

- A hard, creative scrutiny of our present mental hospital system. . . .

- That this hospital system eventually be replaced by a constellation of psychiatric resources in the heart of the community. . . .

- The gradual conversion of State hospitals of more than 1,000 beds into excellent professional treatment centers for all chronic diseases (including psychiatric disorders) and their replacement by community clinics, general hospital psychiatric units, special intensive treatment centers, and such after-care and rehabilitation services as day hospitals, night hospitals, or foster family care. . . .

- The redefining of what treatment is and who may do it—the adoption of a broad liberal philosophy of treatment which would enable many professional and nonprofessional workers without medical training to share the workload. . . .

- The recruitment of sorely needed qualified people into mental health fields.

- An increase in our basic research and more varied and long-term research to predict and prevent various forms of mental illness. . . .

Let us, in and out of Government, reevaluate our thinking about mental illness and how we have dealt with it. Let us ask ourselves—are even the modest advances we have made in recent years on the right track? Or do we need an entirely new point of departure? Are we exploring every possibility and innovation—psychological, social, and biological? Are we properly evaluating each scientific research program? Are we using our hospitals—the places where the patients are—as the logical place for constructive research? Are we as individuals ready to accept and act on the findings provided for us?—*Excerpt from an address by ABRAHAM RIBICOFF, Secretary of Health, Education, and Welfare, before the Mental Health Institute, Saint Elizabeths Hospital, Washington, D.C., May 3, 1961.*

Interrelationship of Poverty and Disease

M. ALLEN POND, M.P.H.

CLEARLY, poverty and disease are bedfellows, yet the precise relationship of one to the other continues to be unknown. Does poverty spawn disease? Or are people impoverished because they are sickly?

Kimble (1), in his remarkable study on tropical Africa, has said, "It is bad enough that a man should be ignorant, for this cuts him off from the commerce of other men's minds. It is perhaps worse that a man should be poor, for this condemns him to a life of stint and scheming, in which there is no time for dreams and no respite from weariness. But what surely is worst is that a man should be unwell, for this prevents his doing anything much about either his poverty or his ignorance."

This paper examines recent material dealing with poverty and disease, particularly in the United States. And an attempt is made to establish a useful perspective on this most difficult and baffling subject.

For nearly a century there has been spirited pursuit of proof that housing quality affects health. Housing quality is subject to relatively precise measurement and health status also is measurable, yet mathematical proof of a cause-and-effect relationship between housing and health so far has eluded students of the subject.

The relationship between poverty and disease is even more complex, but it is generally believed that they are related, and there are facts to back up this belief.

General Observations

Historically, the healthiest nations have been those with the highest incomes and the lowest illiteracy rates. At the beginning of this century life expectancy at birth was greater in the

United States, Great Britain, and the Scandinavian countries than it is today in many parts of the world. Yet, as late as 1955, India had the same life expectancy at birth, 35 years, as existed in Massachusetts and New Hampshire in 1789 (2), and in 1957, even though the reported birth rates for the two countries were about the same, life expectancy for the newborn in the United States was 70 years, twice that for India.

Data like these abound but they are of little avail in determining the relationship between poverty and disease. We cannot measure the precise influence on health of each of the numerous factors that are comprehended by the word "poverty." In this paper I have used the term "low income" to denote poverty, but even this rough symbol may be suspect since in the United States a yearly income of \$2,000 is regarded as low, whereas half the population of the world has an annual income of \$200 per capita.

Communicable Diseases

Throughout history communicable diseases have struck most severely among the poor. Even today, it is the serious communicable diseases that present the greatest threats to the health of people in underdeveloped lands. Many diseases that are virtually unknown or nonexistent in the United States and other economically favored nations are the main

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causes of death and disability among large population groups elsewhere on the globe.

Communicable diseases are caused by living organisms—bacteria, viruses, protozoa, and the like. These diseases may result from a single infection produced by direct contact, ingestion, inhalation, or injection, and they may be prevented by artificial or natural immunity or by the establishment of environmental barriers between the infecting organism and the non-immune host. These are the kinds of diseases whose control implies an understanding of the germ theory of disease, a sanitary environment, uncrowded living conditions, and satisfactory nutrition.

Typhoid Fever

An example of what can be done in the control of an important communicable disease is the practical control of typhoid fever in the United States.

Individual immunity to typhoid fever results either from infection or vaccination. Typhoid vaccine is demonstrably effective. However, it serves best as a temporary preventive and does not replace sanitary measures for effective control. Furthermore, the vaccination rate varies significantly by locality, age, and sex, and nowhere is it high. With the exception of members of the armed services, Americans are not effectively immunized against typhoid fever. For the civilian population, vaccination has not been a prime factor in controlling this disease.

There is ample evidence that typhoid fever occurs as the result of inadequate or poor sanitation. Thus, we might assume that elimination of sanitation hazards would be paralleled by a reduction in the typhoid fever rate. Experience supports such an assumption. As the standard of living has risen—we may take as an index the increase in the percentage of households with inside running water and flush toilets—typhoid fever has become less prevalent.

Yet typhoid fever has become a rare disease not alone because today's poor may be better off than their counterparts of years gone by. Rather, this public health feat has been accomplished through a combination of circumstances. With the increase in urbanization has come greater utilization of community water supplies.

Fewer Americans than ever before, proportionately and absolutely, are today dependent on potentially unsafe private wells and cisterns for their drinking water. Even the poorest city dwellers have ready access to the municipal water supply, which is usually piped into the house. They no longer have to haul water from the neighborhood pump or well, which all too often was contaminated. Furthermore, the application of scientific purification measures has made public water supplies in this country about as safe as any in the world.

Typhoid fever is a disease that has succumbed to a continuing rise in the standard of living, accompanied by widespread improvement in sanitation of the environment. And it is the poor who have benefited most.

Poliomyelitis

Poliomyelitis is a communicable disease whose spread may or may not be associated with faulty environment. So far as is known, it does not normally attack one socioeconomic group more often than another.

Prior to the introduction of Salk vaccine, epidemic poliomyelitis cases tended to be scattered widely and relatively uniformly throughout the community without preference for any socioeconomic group (3). Recently, however, an inverse correlation between income and the incidence of poliomyelitis has developed. The 1960 epidemic in Providence, R.I., was noteworthy especially for its concentration of cases in census tracts classified as lower and lower-middle class from a socioeconomic standpoint. These are the neighborhoods of large families, often severely crowded in their dwellings. Conversely, upper economic areas were remarkably spared. Persons living in the high-income areas, in addition to their less crowded living conditions, were significantly more frequently vaccinated than those in poorer sections of the city.

Community surveys have shown that immunization rates for diseases such as poliomyelitis, diphtheria, and whooping cough are a function of socioeconomic status—the higher the socioeconomic class, the higher the level of immunization. These findings have been consistent the country over.

According to Sirken and Brenner (4), among

persons under 50 years of age, the poliomyelitis vaccination rate was twice as high, on the average, among individuals in families with incomes of \$7,500 and over as among persons in families whose income was under \$3,000. However, this direct correlation between income and frequency of vaccination is much more marked for the white than for the nonwhite population. In fact, among nonwhite school-age children, vaccination was not correlated with income. Persons living in families with an income under \$3,000 received most of their inoculations at work or at school, yet mass poliomyelitis vaccination programs failed to reach more than roughly a third of the target population. Efforts are being made to determine the reasons for the apparent weakness of mass vaccination programs.

Tuberculosis

Tuberculosis is a disease that not only is most prevalent among the poor, but also causes serious economic distress.

Since the highest tuberculosis incidence occurs among slum dwellers, some investigators have cited substandard housing as a prime causative factor. Others dismiss housing quality as being only symptomatic of the so-called slum complex.

It has been held, also, that diet plays an important role in determining the relative susceptibility of individuals to tuberculosis, and that the malnourished are especially susceptible. One of the principal proponents of this theory (5) has said, "I cannot resist the temptation to express my belief that . . . it is most unlikely that drugs alone, or drugs supplemented by vaccination, can control tuberculosis in the underprivileged countries of the world as long as their nutritional status has not been raised to a reasonable level."

Although the exact role of either housing or nutrition in the epidemiology of tuberculosis is unknown, it may be assumed that the improved standard of living of the American people has contributed materially to reducing the incidence of the disease. Indeed, Lowell (6), after detailed study of the tuberculosis problem in New York City, concluded that "if optimum benefits are to be realized in mastering tuberculosis, progress in medicine and public health must

be accompanied by comparable and parallel socioeconomic improvements in living conditions."

Before discussing some of the relationships between poverty and noncommunicable diseases, I will recapitulate the main points made so far.

There are two pertinent lessons to be learned from the oversimplified portrayal of the decline of typhoid fever in the United States. First, a rise in the standard of living of low-income families may reasonably be expected to strengthen the defenses against diseases spread through faulty environment. Second, when specific preventive measures are available, their application through organized community effort will break the chain of infection, thereby leading inexorably to disease control. Typhoid fever is a disease for which community action has been a basic factor in control.

In contrast, poliomyelitis is a disease for which individual action, namely, the seeking of vaccination, is of prime importance in establishing control. Poliomyelitis is increasingly a disease of low-income families. The question is: Why do low-income families not avail themselves of opportunities to be vaccinated? The evidence shows that cost alone is not the deterrent.

The decline of tuberculosis undoubtedly has resulted from mixed and probably overlapping causes. Up to now, BCG vaccination has not been used enough in the United States to have had a significant impact on the epidemiologic picture. Effective casefinding through public health action, isolation of active cases, and efficient therapy have removed many sources of infection. The question remains, however: What has been the role of improved living conditions, including better nutrition, in this change?

Noncommunicable Diseases

The comparative conquest or amelioration of communicable diseases has contributed materially to the prolongation of life in the United States. As man lives longer, however, he becomes more liable to attack by those chronic and degenerative diseases usually associated with adult life. Yet, with the exception of mental illness, relatively little attention has been paid

to the role of socioeconomic factors in chronic and noncommunicable diseases.

Cancer

Morbidity data collected by the National Cancer Institute in 10 metropolitan areas of the United States were analyzed by Dorn and Cutler with a view to determining the relationship between socioeconomic status and cancer incidence (7). They demonstrated that cancer incidence in the lowest income group is 15 percent above the average for all income groups; and that for all forms of cancer combined, incidence is inversely related to income. This association is not limited to occupational exposure since it occurs among women as well as among men. They suggest that factors such as diet, personal habits, and general environmental conditions are probably involved, and that genetic influences also may be implicated.

Buell and his co-workers have reported on the deaths of 10,401 California men aged 20-64 years who died of cancer in 1949-51 (8). In their study, laboring men, that is, those in the lower social classes, had a significantly higher mortality risk from cancer of the stomach, esophagus, or buccal cavity and pharynx than did those in occupations with usually high incomes. Their study also brought out the generally higher mortality risk for laboring men from diseases other than cancer.

Buell and his associates observed that "while it is possible that lower socioeconomic status carries exposure to a higher risk for a number of diseases, the reverse may also be true. . . ." They go on to note that, in the case of cancer, the clinical history of most cancers is so short as to make it reasonable to reject the hypothesis that the disease causes the low socioeconomic status. To this observation one might add that cancer may still be a very expensive illness.

Evidence has been accumulating that the incidence of cancer of the cervix is inversely related to socioeconomic status. Stocks has shown that the death rate for uterine cancer among married women in England and Wales increases as social class decreases (9). Logan has confirmed this observation but has shown simultaneously that mortality from cancer of the breast increases as socioeconomic status rises

(10). Similar observations were made by Dorn and Cutler in the report cited (7).

Premature Births

Rider and co-workers have shown a distinct association between premature birth and socioeconomic status (11). In Baltimore, among 27,979 births to white mothers in 1950-51, frequency of premature births was significantly higher among mothers in the lower socioeconomic strata. Additionally, the prematurity ratio for all nonwhites (11.3 percent) was considerably above the ratio (7.3 percent) for the lowest socioeconomic tenth of the white group. These authors point out that "it is not unlikely that this latter difference is also associated with a corresponding difference in socioeconomic level."

Accidents

Data on personal injuries collected by the National Health Survey during 1957-58, analyzed by Gentile (12), show a high inverse correlation between family income and number of restricted activity days, a measure of accident severity. Males in families whose income was less than \$2,000 had an average of 5.4 days of restricted activity in contrast to only about 2 such days for males in families with incomes of \$7,000 or more. Males in the group with incomes of \$4,000-\$6,999 had 1.8 restricted activity days. Although females generally had fewer accident-caused restricted-activity days than males, females in the highest income group had slightly more such days than males in the same income group. The rate for females in the lowest income groups was 3.5 days per person per year compared with 1.6 days in the income group \$4,000-\$6,999 and 2.2 days for those with incomes of \$7,000 or more. The question may be raised: Are the poor especially subject to severe accidents or is their income status a result of their incapacities?

Although accident severity, as shown by the above data, is inversely related to income, accident frequency rates apparently increase with income. I say "apparently" because the experts believe that there is a positive correlation between educational level and reporting of minor health conditions. Without regard to

this possible reporting bias, National Health Survey data show 22.7 accidental injuries per 100 persons per year among families with incomes under \$2,000, and 32.7 such injuries per 100 persons in families with incomes of \$7,000 and over.

Chronic Conditions

Disregarding specific disease entities, Gleason studied the 1958 prevalence of "chronic conditions" among the noninstitutional population of the United States (13). Four out of every 10 persons had one or more "chronic conditions." Of these approximately 70 million persons, 13.5 million were limited in the amount or kind of their major activity, such as work, school attendance, and keeping house, or in their pursuit of outside activities. Another 3.5 million could not carry on their major activity. Thus, 1 American in 10 had some long-term limitation of activity due to chronic illness or impairment.

The prevalence of chronic limitation of activity and mobility was inversely associated with family income. About 1 person in 5 in low-income families had an activity-limiting condition, while only 1 in 14 of those in high-income families was so afflicted. Mobility limitation was proportionately six times as frequent among persons in low-income families as in families having \$7,000 or more annual income.

These relationships between income and limitation of activity and mobility were consistent for each age group studied, although the frequency rate for "chronic conditions" rises rapidly after age 45. The highest rates are among those 65 years old and over in families having less than \$2,000 annual income. As the survey report indicates, however, "There is no way to determine from these data the extent to which family income and chronic limitation of activity are causally related, nor is it possible to determine whether low income is responsible for the chronic disability or vice versa."

Dental Conditions

Chope and Breslow have reported on the relationship of income to loss of teeth among apparently healthy Californians age 50 years and over (14). These authors show a significantly

high correlation between low economic status and the loss of teeth among older adults, a fact recently confirmed by the National Health Survey. It has been suggested that excessive loss of teeth among adults of low income may be explained by both poor diet and inadequate dental care.

Various investigators have shown a positive correlation between less serious dental defects and low socioeconomic status. However, studies among groups with extremely low incomes in various countries around the world show no consistent pattern of dental defects and suggest that poverty is not necessarily accompanied by poor teeth.

A 1958 study of 491 preschool children in Brookline, Mass., showed no significant relationship between socioeconomic levels and malocclusion (15). In that study Calisti and his co-workers brought out an interesting sidelight on the incidence of such conditions as finger sucking, fingernail biting, and tongue, lip, or cheek habits. Such habits were observed significantly more frequently among children in high-income families than in those from low-income homes. The "why" of these differences is, in the authors' words, "a subject for future investigation."

In comparing material on the relationship of poverty to chronic disease with material on the relationship of poverty to communicable diseases, it is evident that there has been less thorough study of the former and that the known facts are less persuasive. At this point in time, probably the most that can be said is that the role of poverty in chronic disease is not well understood.

Social Consequences

Apart from the actual incidence of disease as it relates to socioeconomic status, the impact of disease on the ability of the wage earner to work or of the child to attend school is a matter of general concern.

Bergsten has shown an inverse relationship between family income and time lost from work due to illness and injury. Her report shows that "usually working" persons in families with annual incomes of less than \$2,000 lose an aver-

age of 10.3 days from work per year compared with only 5.9 days for "usually working" persons in families with incomes of \$7,000 or more (16).

For all days of restricted activity, that is, reduction in usual pursuits due to illness and injury, the rates ranged from 32.4 days per person per year among persons in families with incomes of \$2,000 and under to 16.5 days for persons in families with incomes of \$4,000-\$6,999. There was virtually no difference in the rates for persons in families whose income was between \$4,000 and \$7,000 and those in higher-income families.

Bergsten offers a possible explanation of the higher incidence rates for restricted activity days among persons in lower-income families. She suggests that (a) they are more subject to restricting illness because they use medical care less frequently and have poorer diets than those who are economically more favored; (b) they have lower incomes because of their illness; (c) they are unemployed or are not seeking employment because they are in poor health; and (d) those who are employed might tend to work less or to take poorer paying jobs because of their health problems.

The number of bed-disability days, also, is inversely related to income. Persons in low-income families averaged 12.2 days of bed-disability per year compared with 6.0 days for persons in families whose income was \$7,000 or higher. Females consistently averaged more bed-disability days than males, although the disparity grew with increase in income.

With regard to sex differences in work-loss days, in low-income families the rates were higher for males than for females. Among persons in high-income families, "usually working" females lost slightly more days from work, on the average, than males. The study revealed no important differences in rates of loss of time from school among children in the various family income groups, the annual average being 8.4 days per child aged 6-16 years.

Bergsten has reviewed sample survey data on a variety of health topics for children and youths under 25 years of age (17). In her analysis she pointed out that, while children in families with incomes under \$4,000 a year had about the same average number of days lost

from school (8.9) as did children from higher-income families (8.2), there was a strong positive relationship between family income and frequency of physician visits. For children 14 years old and under, rates for physician visits in families with incomes of \$4,000 or more were one and one-half times, and for dentist visits three times, those for children in lower-income families.

These observations on the use of health services are discussed in greater detail in the National Health Survey reports. As a measure of the interrelationship of poverty and disease, the use of health facilities and services is a significant index. The survey shows that members of low-income families, when admitted to short-stay hospitals, stay significantly longer than do patients from high-income families (18).

Bergsten, reporting on data collected during July 1957-June 1959, shows that the frequency of visits to physicians is directly related to family income (19). Persons in families having annual incomes under \$2,000 had a rate of 4.6 physician visits per person per year compared with 5.7 visits for persons in families with incomes of \$7,000 or more. There were comparable differences throughout the entire age range. Children through 4 years of age in high-income families had 80 percent more physician visits than did children in families whose income was under \$2,000 (7.6 vs. 4.2).

The total civilian noninstitutional population of the United States in the period July 1957-June 1959 averaged 1.5 dental visits per person (20). But the rates varied greatly among different income groups from an average of 0.7 visit per year for members of low-income families to 2.5 visits for those in families having \$7,000 or more. However, there was an inverse relationship between extraction and denture rates and income.

A positive relationship also has been shown between educational achievement and the rate of use of dental services, regardless of income. Among persons in families whose income was less than \$4,000, the rate of dental visits was approximately twice as high for those whose family head had 9 or more years of school as for those whose head had less education.

A definite relationship between family income and time interval since last dental visit also has

been shown (21). About one person in two among high-income families, but only one in five in families whose income was under \$2,000, had visited the dentist within a year prior to interview. Conversely, 1 individual in 4 among low-income but only 1 in 10 among high-income families has never visited a dentist. Furthermore, the number of persons who have never visited a dentist varied inversely with income and education.

Discussion

The precise relationship between poverty and disease presents many baffling questions. How does the material reviewed above contribute to our understanding of the basic issues?

First, it emphasizes that we lack irrefutable proof that poverty causes disease. Undoubtedly, poverty is a major factor in malnutrition, which, in turn, may reduce resistance to invading organisms such as the tubercle bacillus. However, animal experimentation suggests that poor nutrition, per se, does not seriously affect the course of disease. Poverty also causes people to live under insanitary conditions. These contribute to the spread of some of the infectious diseases, especially diseases of the intestinal tract. But poverty alone causes neither tuberculosis nor typhoid fever. At most it helps to provide the environment in which these and other diseases may flourish.

Second, some of the material suggests that, under certain circumstances, disease may cause poverty. Sickness inevitably imposes a financial burden in the form of charges for health services. In severe illness, this burden can be devastating. Additionally, long illnesses may reduce family income. Indeed, the earning capacity of the breadwinner may be destroyed and economic catastrophe may be visited upon the whole family.

Third, low income is a barrier against the use of preventive medical techniques and services. For example, low-income families are inadequately immunized against preventable diseases, and they use pediatric services less frequently than do high-income families.

Finally, the use of dental care services, possibly the best index of elective health action by families or individuals, is significantly related

to socioeconomic status—the lower the income, the less frequently dentists are seen.

In summary, there is a need for continuing and expanding our efforts to raise the standard of living and to improve educational opportunities. These are the sinews of better health. Without them, no society can be healthy. Poverty and disease go hand in hand, and removing the burden of poverty from the shoulders of the less fortunate will contribute to the health of all.

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High Calcium Diet for Osteoporosis

Scientists at the Public Health Service's National Institutes of Health have found that diets high in calcium may offset the thinning of bones of arthritis patients treated with cortisone and other corticosteroids.

Osteoporosis, a bone-thinning disease marked by excessive calcium loss, principally from the spine, affects 30 percent of women past the menopause and is probably more common among older women with rheumatoid arthritis, according to NIH researchers. The bone disease is known to become worse in patients who receive corticosteroid hormone therapy for relief of arthritis.

Dr. G. Donald Whedon of the National Institute of Arthritis and Metabolic Diseases and his associates, Dr. Leo Lutwak and Preston Smith, performed 13 studies to determine the amounts of calcium lost or gained in 11 patients given different hormone preparations. Despite varying responses, the results gen-

erally support the belief that corticosteroids cause calcium loss.

In two studies large increases of dietary calcium, by supplements of milk products and calcium lactate tablets, produced calcium storage even during corticosteroid hormone therapy. Similar diets given to seven patients with postmenopausal osteoporosis who were not receiving hormones prevented calcium loss in six of the patients and enabled four of them to begin storing it. This suggests that abundant calcium in the diet during adult years may protect the skeleton.

The studies support previous findings that diets high in calcium are not harmful. Moreover, the studies suggest that a high calcium diet is now the most reasonable clinical procedure for protecting arthritis patients from the bone-depleting effects of corticosteroid therapy.

Strategy in Evaluating the Effectiveness of Community Mental Health Programs

DAVID J. VAIL, M.D.

THE PROBLEMS of evaluating the effectiveness of community mental health programs were the subject of a recent study in Minnesota. The study was based on an analysis of statistical reports received by the Minnesota Department of Public Welfare for the fiscal year 1958-59. These reports had been submitted to the central agency in accordance with standard reporting procedures set forth by the Public Health Service. The material was gathered from outpatient clinics, or community mental health centers, in the Minnesota mental health system.

In this paper the terms "clinics" and "centers" or "mental health centers" are used interchangeably. In actuality, the term "mental health centers" is most appropriate, since the Minnesota program is designed by law to include educational, consultative, rehabilitative, and preventive services in addition to the basic clinical ones.

Method

During the fiscal year 1958-59 eight clinics or centers were reporting comparable data. Each center was assigned as a code name the name of an Ivy League college. This was done in order to maintain confidence and to establish an atmosphere of objectivity.

The number of full-time professional personnel (FTPP) was calculated for each operation. This was easily done by adding, for each type of personnel, the products of number of personnel, amount of time, and number of months

spent, and dividing the sum by 12. For example:

- a. Psychiatrist, half time for 6 months, full time for 6 months
- b. Social worker, full time for 12 months
- c. Psychologist, 0.4 time for 5 months

Calculation:

$$a. 1 \times \frac{1}{2} \times 6 = 3$$

$$1 \times 1 \times 6 = 6$$

$$b. 1 \times 1 \times 12 = 12$$

$$c. 1 \times 0.4 \times 5 = 2$$

$$\text{---}$$

$$23$$

$$23 \div 12 = 1.92 \text{ FTTP}$$

Psychometrists and group workers were not counted because only two centers had them. Therefore, the compilations do not include reports of psychometric testing, group therapy, or group work.

The number of unduplicated patients treated per year was recorded directly from reports, as was the number of interviews held for any purpose. The number of man-hours spent in activities outside the clinic setting itself, such as in speaking engagements, consultations, and teaching sessions, was compiled from the reports by a series of tedious but basically simple arithmetical calculations.

So that some kind of total calculation of time spent in both intraclinic and extraclinic activities could be made, interviews were assigned values of 1 hour, 40 minutes, 30 minutes, and 20 minutes each and the total hour-value arrived at was added to the extraclinic time spent in each activity.

Once these figures were determined, a further series of calculations was performed in order to ascertain the amount of product, whether it be number of interviews, number of patients,

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or total time, per full-time professional person, that is, per unit of producer.

Results

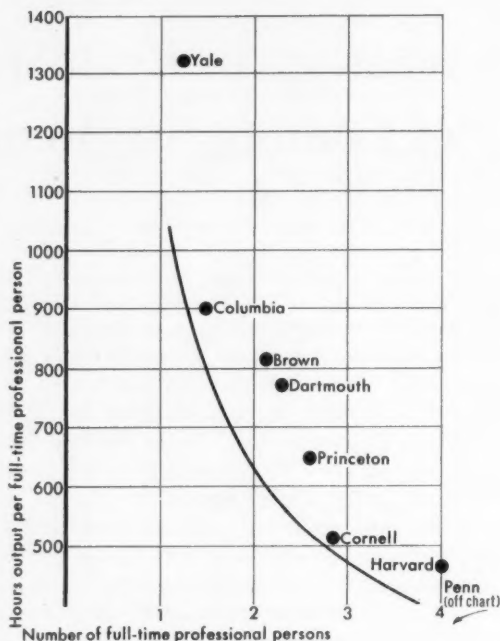
One of the main reasons for measuring quantity of output of mental health centers is the frustration inherent in any attempt to measure value. It is a great deal simpler to measure quantity. But it is impossible to avoid value questions altogether. In an industrial operation there is an easily measurable end product, let us say the number of cars coming off the assembly line. What is our end product? The answer would seem to be the number of patients successfully treated. But how do we define "success"? Or "treated," for that matter? For such reasons as this we elected to study a number of different parameters, all of them centering basically around the amount of work done. The total number of interviews for any purpose was used, rather than interviews with patients only.

Since, by deliberate design of the Minnesota community mental health program, centers devote from 25 to 40 percent of staff time to extra-clinic pursuits, we had to find some way of bringing such activities into the context of work done; hence the procedure of totaling hours spent inside and hours spent outside the clinic. The difficulty of assigning a uniform and average time value per interview is too obvious to dwell on. The multiple calculations help to meet this problem, but there is no apparent way within the limits of human energy to resolve the possibility, indeed the probability, that average interview time differs from one clinic to the next. For example, in one clinic, Yale, interview time may be significantly briefer than in the other clinics.

It was a very short, logical step from calculation of average interview time to consideration of quantity of work, by whatever gauge measured, per unit of producer. This is cumbersome phrasing, but it is well to avoid at the outset a value word like "efficiency." We cannot speak of efficiency until we can measure the amount of desirable end product, that is, successful treatments or cures.

When work per unit of producer is plotted against the number of producers, the resulting

Total hours of interview time per full-time professional person, each interview calculated as 40 minutes



curve is on a typical hyperbola. The chart shows this. This hyperbola is obtained, although with differing rank order arrangements, regardless of the gauge used. Thus number of patients per FFTP, number of interviews per FFTP, extraclinic hours per FFTP, and total time, by whatever method computed, per FFTP, when plotted against the number of producers, all produce the same curve. The total time, shown on the chart, with interviews calculated at 40 minutes each, is typical.

What this means in plain language is that, as the size of the staff increases, the amount of actual, recordable work done by each individual appears to decrease. This is in accord with Parkinson's law (1) and should come as no surprise to anyone who has been committed to death in organizations. The finding is also consistent with information on input-output relationships in the general behavior systems theory (2).

A word about rank order. Rank order for a variety of scales is shown in the table. Yale is persistently at the top and Penn, persistently

at the bottom. For Yale this may be explained by unusual productivity or by some difference in average of duration in interviews; for Penn, by unusual nonproductivity. Since different rank order relationships are produced by the use of different scales or combinations of scales, it would appear that, with the limited material available, it may not be possible to make valid or meaningful statistical correlations.

The Quality-Quantity Problem

Objections to the foregoing methods are obvious. Even assuming that recording of data is accurate, that all patients and interviews and, more particularly, involvement in extraclinic activities are being properly reported, what do the results mean? The fact that one group puts in more time on the job, sees more patients, gives more consultations, or makes more speeches than the other groups has no necessary relationship with the quality of its work or with its significance in or impact on the community.

Residue time is presumably taken up with conferences, and these are not recorded or reported. We surmise that if the staff spends time in considering and discussing cases there can be better mutual understanding of the therapeutic tactics and strategy to be pursued in each case and that performance will be improved. Unfortunately, there is no way of proving this.

The clinic program director faces a serious dilemma. He wishes to increase the overall output of his team by adding new members.

And yet he knows that, if he does so, in terms of work per unit his team will become less productive. A great deal depends on how sharply the curve for amount of work accomplished drops. The rate at which it does drop or, more accurately, the way in which the drop is made less sharp would appear to be the test of effective administration. "Administration" is used in a broad sense to include the proper selection of staff, assignment of cases, and maintaining of morale. Hypothetically, it would seem that no drop at all is necessary. On the other hand, there is a quality of pessimism inherent in the problem, and we are content to assume that the curve will inevitably be a falling one rather than a straight horizontal line. Analogously, in baseball there is no reason in theory why a batter cannot hit safely each time he comes to bat; empirically, we know that it is not humanly possible for him to hit safely more than 4 times out of 10 for any protracted period.

Comment

Increasing the size of the mental health center staff does something more than add to the total output of the center or subtract from the output per producer. It makes available a greater variety of personalities for administering therapy. This is on condition that the personalities brought into the team are significantly different from one another. We refer here to what might be called the versatility factor. If personalities of new members are identical to those of current members, no

Rank order of eight mental health centers, Minnesota, fiscal year 1958-59

Rank order	Interviews ¹	Number patients ¹	Extraclinic hours ¹	Length and number of interviews ¹				Number full-time professional persons ²
				1 hour	40 minutes	30 minutes	20 minutes	
1-----	Yale-----	Brown-----	Columbia---	Yale-----	Yale-----	Yale-----	Yale-----	Columbia.
2-----	Brown-----	Yale-----	Yale-----	Brown-----	Columbia---	Columbia---	Columbia---	Brown.
3-----	Dartmouth.	Harvard---	Dartmouth.	Columbia---	Brown-----	Brown-----	Dartmouth.	Yale.
4-----	Cornell-----	Princeton---	Princeton---	Dartmouth.	Dartmouth.	Dartmouth.	Brown-----	Dartmouth.
5-----	Princeton---	Columbia---	Harvard---	Cornell-----	Princeton---	Cornell-----	Princeton---	Princeton.
6-----	Columbia---	Dartmouth.	Brown-----	Princeton---	Cornell-----	Princeton---	Cornell-----	Cornell.
7-----	Harvard---	Cornell-----	Cornell-----	Harvard---	Harvard---	Harvard---	Harvard---	Harvard.
8-----	Penn-----	Penn-----	Penn-----	Penn-----	Penn-----	Penn-----	Penn-----	Penn.

¹ Per full-time professional person.

² In ascending order. Actual numbers are: Columbia, 1.42; Brown, 2.1; Yale, 2.2; Dartmouth, 2.25; Princeton, 2.57; Cornell, 2.9; Harvard, 4; and Pennsylvania, 4.1.

progress along these lines is possible. This is a hazard of the classical small team, whose members must get on well together, that is, they must like each other, which is another way of saying they must be like each other. To the extent that they are like each other, versatility is diminished. That this is no insignificant factor is seen when we realize that the number of possible relationships within an organization increases both factorially and exponentially with the number of members and the number of attitudes. The actual formula appears to be

$$N = (p!)^q$$

where

N = number of relationships

p = number of members

q = number of attitudes

"Organization" in this sense must be extended to include not only the team members but the patient and his family as well. One advantage of group and family therapy is that in the deliberate utilization of the personalities of the group members and their capacities for relationship with each other, one maximizes to a fantastic degree the versatility factor. In this same respect proper selection of staff and optimal assignment of cases are viewed as critical functions of the program director.

A final word about evaluation of results. Let us define therapy in the first instance as a process of change through relationship which we must assess. A change from what to what? Postulations as to change in basic personality or character structure, if indeed this is ever really accomplished, appear to be meaningless and to resolve finally to questions of value. If I am

beat and you are square, there is no way of reconciling our contempt for one another's way of life. If I am neurotic and you are stupid, the same problem exists. When patient and therapist differ and one changes to become like the other, if the victor happens to be the therapist he can chalk up a successful case to his credit. But we have not really solved anything.

For this reason, the most satisfactory measure of results may, in the final analysis, be a symptomatic and experiential one: work with conditional responses and physiological periodicity and refinements in concepts of phenomenology show some promise in this connection. Certainly, for statistical purposes we have no measure which we can use at this time.

There is an interesting story, possibly apocryphal, of General Grant at the Battle of the Wilderness. At the close of the fighting one of his aides came to him with the report that the battle was over and the Union forces appeared to be victorious. Grant is said to have asked one question: "How many prisoners did we take?" For him at this time and under these circumstances, this was evidently the datum which would give him the most significant information. We are faced with the sad fact that we have no such yardstick. Until we do have one, the question of evaluation must be held in abeyance.

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Correction

In "Public Health and Medical Aspects of the Roseburg, Oreg., Disaster," published in the August 1961 issue, p. 727, the force of the explosion was erroneously given at 26 kilotons of TNT bombs. The correct force is 13 tons.

A Community Mental Health Project in New York State

CATHERINE COVERT STEPANEK and CHARLES V. WILLIE, Ph.D.

THE Onondaga County Board of Supervisors in 1955 established the community's first mental health board. Set up under New York State's pioneer Community Mental Health Services Act of 1954, the new board was authorized to coordinate existing mental health services and to develop a comprehensive mental health program for the community as a whole. Financing was to come half from the county and half from the State.

Members of the professional community, the social and health agencies, the major religious groups, and the interested public greeted the county supervisors' action as a major step toward an effective county mental health program.

Four years later, many of the professionals in the county mental health clinics had resigned. Stripped of its personnel, the county child guidance center announced that it would close. The directors of that clinic and of the adult clinic had resigned, although the adult clinic was able to remain open. Members of the county mental health board and the county supervisors had disagreed on the issue of autonomy for the mental health board. By November 7, 1959, shortly before election day,

only concessions by the supervisors forestalled the mass resignation of the county mental health board.

Several other New York counties which embarked on mental health programs have experienced comparable difficulties (1). Factors in the law, in the county system of government, and in the actions of community groups are discussed below with reference to these events.

Community Background

Onondaga County, in central New York State, has a population of 422,206, including Syracuse, with 215,291 inhabitants, engaged mainly in industry and commerce. Syracuse has a major university and a small liberal arts college, a medical school operated by the State University of New York, and several voluntary teaching hospitals with residency training in almost all specialties, including psychiatry. The primary responsibility for health and welfare planning in the community has been exercised by the Community Chest and the Council of Social Agencies.

County affairs are governed by a 38-man board of supervisors, half from the 19 wards of Syracuse and the others from the 19 towns (townships). This board elects its own chairman, who acts as administrative officer of the county on a part-time basis. Department heads report to a series of committees of the supervisors who in turn make recommendations to the entire board in the form of resolutions. Once acted on favorably by the board, these resolutions in effect decide local policies within

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the limits set by State law. The committees have varying degrees of power, but the two most important are the salaries committee, which decides on all county employee salaries and financial benefits, and the ways and means committee, which recommends the annual budget.

The early history of mental health activities in Onondaga County was detailed by Winslow in 1934 (2) beginning with the founding of the Mental Hygiene Committee of the Onondaga Health Association (a voluntary health organization) in May 1925. An experienced psychiatric social worker was appointed to serve as executive secretary of the committee in September of the same year. Educational programs began in December, and by the following year professional mental health personnel were on the staffs of several agencies, including the health department and the free dispensary. In 1930 the Syracuse State Psychopathic Hospital was opened for outpatient and inpatient services.

From the early 1930's to 1945, however, no sizable body of citizens had emerged as an effective community group in mental health affairs. The community leaders remained unconcerned with mental health planning.

Origins of Modern Services

Postwar planners in 1944 and 1945 called attention to the community's lack of diagnostic and treatment facilities for children. In 1947 the county board of supervisors moved to set up a county child guidance center under the children's court. With the appointment in 1948 of a trained psychiatrist to direct the center and of psychologists and psychiatric social workers to staff it, the clinic was a source of pride to the county supervisors. They kept in close touch with clinic personnel, gave regular increases in the initial budget of \$22,548, and generously supported its services. Differences between supervisors and clinic staff, if they occurred, were usually conciliated by members of a citizens advisory committee to the center, prominent laymen and professionals in the field of health and welfare.

The success of the child guidance center was one factor that encouraged community leaders to propose a parallel service for adults. The

mental hygiene committee of the Council of Social Agencies drew up plans for a new adult psychiatric clinic, to be operated at the Syracuse Dispensary and supervised by the College of Medicine. The Onondaga Health Association offered \$5,000 and the Council of Social Agencies \$4,200 in private funds toward expenses of the clinic's first half year of operations. This proposal was the forerunner of a plan later adopted and incorporated into a countywide program under the State's Community Mental Health Services Act of 1954.

Thereafter, the mental health committees of the Council of Social Agencies, the Onondaga Health Association, and the medical school sought the establishment of a county mental health board to develop community mental health services. On the advice of the chairman of the board of supervisors, the community mustered impressive witnesses to testify at a public hearing in behalf of the proposed legislation.

The county's research department issued a detailed report favoring the establishment of the new board (3). There was no organized opposition such as had successfully fought establishment of a county health department.

The supervisors were also influenced by economic considerations. If they took no action under the Community Mental Health Services Act, the county would face the loss of approximately \$18,400 being received in annual State aid for the child guidance center through the New York State Youth Commission.

Shortly after local approval of the legislation in 1955, the chairman of the board of supervisors appointed to the new county mental health board nine members representative of community groups interested in mental health. Included was the attorney who had been chairman of the Council of Social Agencies mental health committee, a woman soon to be recognized by election to the board of directors of the New York State Association of Mental Health Boards, the dean of the medical school, the diocesan director of Catholic Charities, a practicing physician, a practicing psychiatrist, and a school official. Named by law as ex officio members were the city health commissioner and the county commissioner of welfare.

Drift Into Isolation

After the mental health board was appointed, there was a separation of the general community from concern with mental health.

The citizens advisory committee to the child guidance center offered to continue, but the mental health board did not invite it to do so, despite its valuable experience in the delicate art of explaining politicians and professionals to each other. At the same time the mental health committee of the Council of Social Agencies dissolved under the impression that mental health affairs would be handled in the future by the new board. The health and hospitals division of the council had become inactive several years before. The only part of that division to continue actively was a "planning committee" whose actions were limited largely to reviewing requests from health agencies for funds from the Community Chest.

Meanwhile the Onondaga Health Association's mental health activities were largely devoted to an internal reorganization, resulting in a larger division of the association for mental health by 1959 but leaving little time until then for outside concerns.

There was meanwhile a growing concern among some local leaders that the medical school was retreating from community involvement. Long a bulwark in local health planning, the school was becoming more and more preoccupied with education, research, and its building program. Local practicing physicians who had long headed medical school departments on a part-time basis were being replaced with full-time educators who had either restricted private practices or none at all. These full-time professors were understandably more occupied with school than civic affairs.

The chairman of the department of psychiatry at the medical school, who served actively on the mental health board from 1956, stated in 1959 that medical center participation in the community program could continue only "if we are sure the program is not capricious, not subject to the whim of political change. We have no recourse other than to withdraw if the situation gets too unstable."

The threat of the withdrawal of the medical school raised the fear of no more service in community mental health clinics from physi-

cians in the psychiatric residency program, and no further appointments on the medical school faculty for clinic professionals. These appointments had been a valuable asset in recruiting staff.

This retreat on the part of several segments of the community was noted by the first chairman of the mental health board. He said, "We tried to relate with the community, but it was like relating with a vacuum."

It had been supposed when the board was appointed that its members would represent the community in relationships with the county supervisors, serving as a bridge between community and supervisors. A certain amount of liaison between mental health board and supervisors was conscientiously maintained. But there was no systematic effort on the part of the board to explain itself or its new programs to the public at large, no press releases, no television or radio programs, and no report to the community in general except for that appended to annual budget requests.

Part of the board's inactivity can be traced to its limited staff with limited time for all but the most pressing matters. Inundated by prospective patients, the clinic did not favor any publicity that might bring more patients to the door. "We don't want any more people to find out about us," said one clinic staff member. "We have far too many patients already."

The board, largely through its director and assistant director, met with many community groups in an attempt to work out the best ways of utilizing board services. But these administrators found it difficult to interest other agencies in the board's problems, agencies which were primarily concerned with their own problems. The board continued its mandated tasks. Few knew much about them. The board faced them alone.

The Board's Predicament

The board's problems were rooted in three general situations: (a) situations stemming from the board's own actions; (b) requirements of the Community Mental Health Services Act; and (c) exigencies of local forms and traditions of county government.

Of the situations created by the board itself, one generally criticized in afteryears was the

hiring of a director of the new mental health program on a part-time basis only. He was the same psychiatrist who had served since 1948 as head of the child guidance clinic. He continued full time in that post, adding the duties of the mental health program director to his already overburdened schedule.

This original action was taken because of the dearth of other suitable psychiatrists. But it obliged this one psychiatrist to fit numerous meetings and administrative duties in and around his diagnostic and therapeutic sessions with patients in the child guidance clinic. He had too little time for administration and for community associations. More responsibility was consequently thrown on the full-time assistant director, who found herself without commensurate authority.

In retrospect, it seems it was an error when, after several years of operation, the board decided to bar professionals from sessions with members of the county board of supervisors in order to reduce the turbulence of the meetings. The mental health program had to be presented to the supervisors entirely by the mental health board, and could not be explained at budget time by those who knew it best, the director and assistant director of the mental health program.

The Community Mental Health Services Act had been predicated on the conviction that a local mental health program could succeed only to the extent that local citizens accepted and identified with it (5). The weakness of relationships with the community was previously discussed.

A primary flaw in the law seems to have been the phrasing which made possible an ambiguous relationship between the mental health board and the county board of supervisors.

The county mental health board members believed that the Community Mental Health Services Act invested the board with policy-making powers for local mental health services. The mental health board was given the power by the act to "submit to the . . . (county) governing body a program of community mental health services and facilities; (and) within amounts appropriated therefor, execute such program and maintain such services and facilities as may be authorized under such appropriations" (4).

The mental health board members interpreted the law to mean that they were to execute the programs authorized within the appropriation. "Executing the programs" they interpreted to mean that they might determine the number and nature of the professional positions and set salaries within the total amount appropriated for mental health services.

On the other hand, the supervisors contested this view, preferring to keep a line-by-line budget control, as in other areas of county government.

A second provision of the law specified that two members of any county mental health board must be a health officer and a welfare commissioner. In Onondaga County, the city health commissioner and the county welfare commissioner served. This provision was designed to cut through departmental lines in the coordination of mental health programs. Nevertheless, as governmental employees, charged with requesting budgets for their own departments, these board members were more constrained than private citizens in negotiations with the supervisors.

The law required that a new mental health board must be established as a separate segment of county government. It was not permitted to become part of any previously established agency, such as a health department, with prior experience in government administration. The psychiatrist in charge could not rely on an experienced administrator such as a health commissioner for aid nor could he delegate administrative details to experienced personnel.

As to the nature and customs of government in Onondaga County, the board of supervisors exercises both executive and legislative powers, appropriating money and then determining to a great extent how it shall be spent.

The Onondaga supervisors were here confronted with a county board whose members confidently expected autonomy within a prescribed budget.

In the majority, the supervisors were not prepared by experience or training for judging the value of a program that could not easily be expressed statistically. A majority were not equipped to evaluate claims of possible delinquency averted, possible commitments to State institutions forestalled, or elusive behavior

problems alleviated. Supervisors complained that they were not provided with enough information about accomplishments and that the information they were given was not in terms they could easily understand. "How many people have you cured?" was a question posed on one occasion when supervisors met professionals. It was a question that seemed simple enough to many supervisors. The professionals found it difficult to explain why a clinician could not label a person as definitely "cured" and summarize his year's results in such terms.

The situation was further complicated by the fact that the major center of power in the board of supervisors lay with the chairman, the majority leader of the dominant party, and the chairman of the ways and means committee. Yet the mental health board was required to deal primarily with the mental health committee of the supervisors, where final power did not reside. It was necessary for the mental health board to maintain liaison both with the supervisors' mental health committee which made recommendations and with the three who determined final policy.

Major Issues

Apart from the issue of the legal right and responsibility of the supervisors to exercise line-by-line control over the budget of the mental health board, a continuing controversy centered around the salaries to be paid psychiatrists, psychologists, and psychiatric social workers. There was no declared policy on annual increments. Each increase had to be negotiated separately with the supervisors by the mental health board. As other counties in New York set up similar services and as other States followed suit, the supply of professionals grew ever shorter. Salary expectations rose. By 1959 psychiatrists heading Onondaga County clinics received \$15,000. Principal clinical psychologists received \$8,000; principal psychiatric social workers, \$6,500. These levels were unsatisfactory to professionals who knew that their professional talents were in great demand (6).

Faced with taxpayer complaints and with increasing demands for funds on every side, the supervisors asked the mental health board to

give up anticipated salary increases for a second year. Disagreement also continued over the amount of salary a professional person should be paid in comparison to the nonprofessionals on county payrolls. "After all, we're paying our chief psychiatrists \$15,000," said the chairman of the supervisors' ways and means committee. "Our county auditor is paid only \$12,000; the sheriff, only \$9,000. We have to take care of all our people fairly."

A further difference centered in the employment conditions of professionals. The supervisors and others questioned the amount of time spent during working hours by clinic professionals in paid consultations, study, research, and teaching. "If you give someone a salary, you do it with the reasonable expectation of getting a full-time person," commented the majority leader of the supervisors. "This part-time business bothers people. It's difficult to explain to those concerned about the uses of the tax dollar."

Professionals replied that consulting, teaching, and research were a vital part of their professional lives, necessary to a creative approach to community mental health services.

Crisis

Meanwhile, there was growing professional concern over the adequacy of the services within the allotted budget. More and more demands came in. There were requests from courts, penitentiaries, schools, voluntary agencies, and the welfare department as well as lengthening lines of privately referred patients.

Intake at the clinics was limited. Clinics turned away many individual referrals from agencies. Requests for consultative services also were sometimes refused. In many cases, professionals explained that these refusals were due to lack of funds and personnel.

The supervisors' dissatisfaction with the explanations focused mainly on the assistant director who frequently served as spokesman in dealing with requests.

Individual supervisors felt strongly that their interest and contributions to mental health were being discredited. They had increased annual mental health spending from \$124,225 in 1956 to \$244,333 four years later.

And yet, they contended, all they heard were reports of inadequate funds and personnel, which they called "negativism."

In the fall of 1959 the supervisors, considering the 1960 budget proposed by the mental health board, refused salary increases for a second year and eliminated the salary appropriation for the assistant director of the mental health program. Instead they increased the appropriation for the director's salary, without consulting the mental health board. They were motivated, supervisors said, by a desire to obtain a full-time professional as director of the mental health service.

The mental health board proposed to resign if it were not permitted to spend the money allocated as it saw fit.

A newspaper story under a prominent headline reported that the board of supervisors was charged by the mental health board with "crippling the local mental health program, and usurping the administrative functions of the county mental health board." This was the first full disclosure to the community of the critical situation. Quoted as authority for the story was a board "spokesman" who preferred to remain anonymous. According to this source the board also protested the supervisors' action in proposing to give the mental health program approximately \$2,000 less than it did in 1959, and in declining to approve additional psychiatric residents in the adult clinic.

At the same time the Onondaga Health Association became alarmed over the situation and in turn called numerous interested citizens and organizations about the plight of the mental health services. These people responded by inundating supervisors with demands that they increase the mental health budget and with accusations that the supervisors were "trying to scuttle the mental health program." The board was subjected to this pressure shortly before election day. With 3 days to go, the supervisors changed their stand. They continued the 1959 budget unchanged for another year and restored the assistant director's post.

Aftermath

But the mental health service suffered. Hampered by resignations and unable to find replacements at the salaries authorized, the

child guidance clinic closed. The psychiatrist who had served since 1948 as director of the child guidance clinic and since 1955 as director of the mental health program resigned. The director of the adult clinic had already resigned and left town, although the service continued to function. The only remaining clinic which accepted children for treatment was a contract clinic at St. Joseph's Hospital.

At this point, the Council of Social Agencies was completely absorbed, its executives explained, in its own reorganization.

It was left to small groups of citizens to take spontaneous action. One group including both lay people and leading professionals banded together, met several times, and decided to urge the Metropolitan Health Council to appoint a citizens committee on mental health. The Metropolitan Health Council was a newly established division of the Council of Social Agencies. Such a committee, it was felt, might be able to take some action to bolster the faltering mental health board, and to rescue the community program from disintegration. The Metropolitan Health Council appointed a citizens group to take action in the mental health crisis. The appointments were made in association with the president of the Onondaga Health Association's new mental health division.

At its early meetings the new committee adopted as its objectives: (a) urging appropriate community agencies to develop broadly conceived mental health programs; (b) assisting "in appropriate ways" the supervisors, the mental health board, and other agencies in strengthening mental health services; (c) serving as a forum for community organizations interested in mental health; and (d) encouraging organizations interested in mental health research. The new group was welcomed publicly by the mental health board, the president of the Council of Social Agencies, and the new chairman of the supervisors' mental health committee. By this means a unified community interest in the mental health program was reasserted.

Implications

This study points up the mounting strain imposed on the supervisory form of county government by the increasing complexity of

metropolitan development, by the necessity for maintaining large groups of professionals on public payrolls, and by the need to delegate authority to quasi-official governmental bodies such as the mental health board. Moreover, county boards of supervisors, originally legislative groups, have tended to assume administrative functions.

With reference to citizen initiative in governmental affairs, this case study demonstrates the need of continuing community surveillance and support of semi-official boards that are set up as representatives of the public's interest. There is also an evident reciprocal responsibility of governmental units to seek out and cultivate citizen interest in public affairs.

The facts also indicate a need for training or experience in public health administration for any psychiatrist who essays to direct community mental health programs.

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Parents' Primer on Television

Some of the recommendations of the 1960 White House Conference on Children and Youth on what parents should do in regard to their children's television watching have been put into a simple and amusing form in "Pogo Primer for Parents (TV Division)" by Walt Kelly and published by the Children's Bureau, U.S. Department of Health, Education, and Welfare.

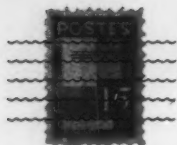
The main theme of the booklet is that television is probably here to stay, but it should be kept in its place in a child's life. It points out that a child should be guided in watching television as in his other activities if he is to be protected from abnormal influences. Katherine B. Oettinger, chief of the Children's Bureau, says in the foreword to the booklet, "Parental selectivity of television fare for children can be a means of broadening their understanding of the world we live in and the culture which is our heritage."



Parents can find out what is best
for a child to watch on t.v.
If a child is not to be injured, he needs help.

The Primer warns against using the television set as an automatic babysitter for children, and asserts the basic principle of child development that children need love and guidance above all if they are to grow up mentally and socially healthy.

Copies of "Pogo Primer" may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., for 20 cents each.



INTERNATIONAL MAIL POUCH

Growing Pains

Although the malaria eradication campaign in Honduras completed its third cycle of DDT spraying ahead of schedule, the southern part of the country experienced a marked increase in malaria, including falciparum cases.

The granting of land titles in the Departments of Choluteca and Valle was followed by the construction of houses for persons immigrating from other departments and El Salvador, and the construction of new highways, with the flooding of borderline. This whirl of activity had the side effect of creating new breeding places for mosquitoes.

—ELROY A. BARREDA, *chief public health adviser, U.S. Operations Mission, Honduras.*

Epidemic in Kedungwaringin

An epidemic of uncertain origin in the village of Kedungwaringin in the Kedunggede area, Indonesia, affected 130 persons in more than 90 families. The death count totaled 78. The epidemic was eventually termed "enteritis necroticus," and *Clostridium welchii* was tentatively implicated.

In the wake of the epidemic, the U.S. Operations Mission gave demonstrations and lectures on sanitation, conducted a cleanup campaign, and installed two sanitary wells. Bed care and other services were provided by a team of nurses.

—ROY M. HARRIS, *chief, public health division, U.S. Operations Mission, Indonesia.*

Chloroquinated Salt

An epidemiologic study of the use of chloroquinated table salt as a malaria deterrent has been recommended for Brazil's Amazon Basin. Limited area studies have established that consumption of the medicated salt reduces the incidence of malaria but have not proved that chloroquine in table salt eradicates the disease.

The proposed study envisages selection of a representative area in the State of Pará and another in the State of Amazonas, which have not been sprayed with DDT within the preceding year. Health workers would conduct a preliminary survey of salt consumption in the areas and apprise the public of the plan.

—DR. VERNON J. FORNEY, *chief, public health division, U.S. Operations Mission, Brazil.*

Miner's Malady

Thirty percent of the cost of a hookworm control project in Taiwan has been advanced by the mine operators. The control of hookworm in the coal miners of Taiwan has long been a major occupational health activity. Each year a different coal mine has been picked as the site for the control project, which engineers the construction of water supply systems and latrines and the decontamination of infested areas. The Shan-Ho coal mine is the site of the 1961 control project.

—WALTER S. SHURKIN, M.S., *industrial hygiene adviser, U.S. Operations Mission, Taiwan.*

Water Level Indicator

A readily portable, relatively cheap, and easily assembled water level indicator has been put to use in Brazil. The apparatus, built of local components, measures the depth of water in wells. The assemblage consists of a probe, an electric wire with foot markings, a reel, a transistor unit, a lamp, and five flashlight batteries. Cost of parts is less than \$5.

While the idea is not original, the engineering is unique. Because high voltage batteries are not readily available in Brazil, the transistor is used to amplify the current from the flashlight batteries to light a 100 milliamper bulb.

—JAMES G. BLEVINS, *well-drilling consultant, U.S. Operations Mission, Brazil.*

Survival of Uterine Cancer Patients in Different-Sized Hospitals

JOHN C. BAILAR III, M.D., and SUSAN LEVY RICE, M.P.H.

SINCE 1956 the National Cancer Institute, Public Health Service, and the Connecticut State Department of Health have been engaged in a study of uterine cancer in Connecticut. The study is based on data from the standard tumor record forms submitted to the Connecticut Tumor Registry by nearly all Connecticut hospitals, supplemented by information from original hospital charts, tumor clinic records, death certificates, and other sources. Although the primary function of this study is to examine the characteristics and distribution of uterine cancer in the State as a whole, statistical reports have been prepared for each of the participating institutions. These individual reports have been pooled to permit comparison of uterine cancer statistics for hospitals of different sizes.

A comparison of patients admitted to different hospitals or groups of hospitals is of course necessary in planning or studying the distribution of medical services and facilities; it also has important applications in the evaluation of treatment.

First, a direct comparison of the survival rates reported by different hospitals is meaningful only if the patients whose survival experi-

ence is compared are essentially alike with respect to such factors as age, extent of tumor, and general health. Dissimilarities among groups of patients studied may account for much of the wide variation in reported survival rates for uterine cancer (1) and other diseases.

Second, knowledge of the characteristics of patients is necessary in evaluating the selective factors determining the choice of one hospital rather than another. Large hospitals, particularly those specializing in the treatment of a limited number of diseases, probably attract selected groups of patients. This means that there is some uncertainty in extrapolating the results obtained in well-known treatment centers to the "average" cancer patient treated in his own community hospital.

A third reason for comparing patients treated in large and small hospitals is to evaluate the effects of hospital size itself. It seems reasonable that there should be some benefits associated with the more extensive facilities and experience of the large institutions. However, except for the limited data previously published from the Connecticut Tumor Registry (2), there seems to have been no systematic study of hospital size and survival rates of uterine cancer patients.

Characteristics of Patients

This report is based on the records of 3,210 patients with cervical cancer and 3,010 patients with cancer of the uterine corpus, all of whom were first found to have cancer during the period 1935-51. These figures exclude patients with carcinomas in situ and those with chorionic

Dr. Bailar is a field investigator, and Mrs. Rice was formerly a student assistant at the National Cancer Institute, Public Health Service. At the time of the study Dr. Bailar was assigned to the section of chronic disease control, Connecticut State Department of Health, and to the department of epidemiology and public health, Yale University School of Medicine. The conclusions are those of the authors and are not an official statement of the Connecticut Tumor Registry.

tumors but include all other patients with uterine cancer listed in the Connecticut Tumor Registry for the period under review. Among those included are 854 who were not admitted to Connecticut hospitals and who were reported by death certificate only. In collecting the data, the original hospital and tumor clinic records were reviewed and abstracted in every case by Bailar so that a high degree of uniformity in definitions and abstracting procedures was maintained.

Hospitals have been grouped according to the number of general hospital beds in each in 1951 (3). There were 5 hospitals with more than 350 beds, 8 with 200 to 350 beds, and 13 with fewer than 200 beds. Information from all cooperating hospitals located in other States and from several Connecticut hospitals reporting only a handful of cases has been excluded from the data for hospital-size group but has been included in the figures for all hospitals combined. For this reason, and because many patients were admitted to more than one hospital, the figures for the separate size groups do not add to the total for all hospitals in the tables which follow. In addition, in some of the tables "Total cases reported" includes the cases reported by death certificate only; these of course do not appear in the figures for different hospital groups. Patients treated at more than one hospital are included with the treatment figures for the first hospital only.

A substantial number of uterine cancers, particularly those reported by death certificate only, were not specified to be of either cervix or corpus. However, a separate study of reporting practices shows that, in general, when Connecticut physicians write "cancer of the uterus," they mean "cancer of the uterine corpus." Therefore, in all the tables, cases reported as cancer of the uterus are included with those specified as corpus. The small hospitals reported a slightly higher proportion of unspecified cases than either of the other hospital groups, but the difference is not significant. The number of unspecified cases has been falling in recent years (2).

Table 1 shows the total number of cervical and corpus cancers reported by hospitals in the different groups, with the number first diagnosed in each hospital-size group and the num-

Table 1. Total cases of uterine cancer reported to Connecticut Tumor Registry and number first diagnosed or treated in hospitals of different sizes, by site of tumor, 1935-51

Tumor site	Total cases reported	Hospital size (beds)		
		Fewer than 200	200 to 350	More than 350
<i>Cervix</i>				
Total cases reported	3, 210	697	922	1, 981
First diagnosis in this hospital group		558	786	1, 533
Treatment in this hospital group ¹		412	653	1, 670
Reported by death certificate only	202			
<i>Corpus and unspecified uterus</i>				
Total cases reported	3, 010	595	673	1, 300
First diagnosis in this hospital group		522	625	1, 135
Treatment in this hospital group ¹		438	540	1, 119
Reported by death certificate only	652			
Specified corpus	² 2, 205	542	622	1, 202
Not specified cervix or corpus	² 805	53	51	98

¹ Includes palliative and supportive therapy when given to patients who did not receive either radiation or surgery as definitive treatment.

² Includes cases reported by death certificate only.

ber who were treated in each group. In this table, one can find the number of cases referred into the hospitals after diagnosis, and perhaps treatment elsewhere, and the number referred out of the hospitals for treatment elsewhere, by subtracting the second or third line from the first line in the table for either site. For instance, the 13 Connecticut hospitals with fewer than 200 beds admitted 139 (697 minus 558) cervical cancer patients who had already had the diagnosis made at another hospital. For both sites there was evidently considerable referral of cases into and out of hospitals in all three size groups. The five largest hospitals admitted and treated more patients than all other hospitals combined, but even the smallest hospitals reported substantial numbers of cases.

A comparison of the distribution of corpus cancers with that of cervical cancers shows that, although the total numbers were nearly the

same, each group of hospitals reported fewer corpus than cervical tumors. This is the result of two factors: a high proportion of corpus cancers were reported by death certificate only; and patients with corpus cancer were less often referred from one hospital to another than were patients with cervical cancers. These considerations may partly account for the common but incorrect clinical impression that in Connecticut cervical cancer is considerably more common than cancer of the uterine corpus.

Table 2 shows, for both sites, the median age of patients at diagnosis, the proportion of tumors localized at the time of diagnosis, the proportion of cases diagnosed microscopically, and the median duration of symptoms before diagnosis of cancer. The figures by size of hospital are based on place of diagnosis and exclude patients referred to the hospital for evaluation or treatment.

Corpus cancer patients were, on the average, considerably older than cervical cancer patients, but within each site group the age distribution

of patients was nearly the same for the three hospital-size groups. For cancers of both cervix and corpus, the median age of the total group of patients was higher than the median age of patients in any hospital-size group because, in general, patients reported on death certificates only were older than those reported by hospitals.

The stage of tumors at the time of diagnosis has been tabulated for two time periods, 1935-46 and 1947-51. The data by stage are based only on information recorded prior to treatment. In both periods approximately one-half of all cervical tumors were confined to the cervix. It is discouraging to find that, for the State as a whole, there was an increase of only 2.5 percent in the proportion of localized cervical tumors reported from the first time period to the second. There was a somewhat greater improvement (4.5 percent) in the proportion of corpus tumors localized at the time of diagnosis. There do not seem to have been any significant differences among the three groups of hospitals in the stage of the tumors of either site at the time of diagnosis. These data therefore do not support the impression that the large city hospitals admit patients with more advanced tumors, and with correspondingly poorer prognoses, than smaller institutions. For both sites, the improvement in stage at diagnosis was shared equally by the three hospital groups.

Of the total number of reported tumors of both cervix and corpus, 92.1 percent were microscopically confirmed. More detailed data show that the proportion of confirmed cases has been rising steadily since 1935. Throughout the study period, the largest hospitals reported the highest proportion of diagnoses based on tissue examination; for the period 1947-51, 98.2 percent of their diagnoses were microscopically confirmed. In recent years, the microscopic confirmation of tumors of the uterine corpus has not been as complete as for cervical tumors.

The data on median reported duration of symptoms before the diagnosis of uterine cancer show that patients with corpus cancer delayed substantially longer than patients with cervical cancer in seeking treatment. For cervical cancer there were no significant differences among hospital-size groups with respect to duration of symptoms before diagnosis. In contrast, the time between onset of symptoms and diagnosis

Table 2. Characteristics of patients with uterine cancer reported to Connecticut Tumor Registry, by site of tumor and size of hospital, 1935-51

Tumor site	Total cases reported	Hospital size (beds)		
		Fewer than 200	200 to 350	More than 350
<i>Cervix</i>				
Median age at diagnosis (years)-----	52. 8	52. 5	52. 5	51. 7
Percent of tumors localized:				
1935-46-----	49. 8	46. 8	50. 9	50. 1
1947-51-----	52. 3	48. 5	52. 5	54. 5
Percent microscopically confirmed-----	92. 1	91. 8	91. 5	94. 7
Median duration of symptoms (months)-----	4. 6	4. 5	4. 6	4. 7
<i>Corpus and unspecified uterus</i>				
Median age at diagnosis (years)-----	60. 8	59. 5	57. 3	59. 3
Percent of tumors localized:				
1935-46-----	77. 3	75. 1	78. 8	77. 7
1947-51-----	81. 8	83. 0	83. 3	81. 1
Percent microscopically confirmed-----	92. 1	90. 8	91. 7	94. 2
Median duration of symptoms (months)-----	5. 6	5. 1	5. 4	5. 9

of cancer of the uterine corpus did vary with hospital size, being shortest for the small hospitals and longest for the large hospitals, with the intermediate-sized hospitals falling between. This is somewhat surprising in view of the finding that there were no significant differences among the three hospital groups in stage of corpus cancer at diagnosis (table 2). The difficulties of measuring the duration of symptoms accurately are well known, and small differences must not be given more emphasis than they deserve. However, the differences observed among the three groups of hospitals cannot be the result of biased data unless there is a consistent bias which is greater in small than in large hospitals, or vice versa, and which operates for corpus cancer but not for cervical cancer. It seems possible that the differences in median duration of symptoms of corpus cancer are real.

Treatment and Survival Rates

Comparing cancer survival rates in different hospitals is hazardous because the patient population may vary from one hospital to another in such important characteristics as age, stage of cancer, and general health. Also, the practice of referring patients from one hospital to another for treatment creates problems of bias and selection in the data. The latter difficulty can be avoided by considering the survival rates of cases first diagnosed in a particular hospital, wherever they may have been treated, but then it is difficult to interpret survival rates in terms of the treatment policies used at the various hospitals. In the present series a further source of difficulty is the relatively high proportion of cases lost. The survival rates given have been computed by standard actuarial methods (4,5), which permit partial use of the data on lost patients. Even so, lost cases introduce an element of uncertainty which cannot be eliminated. In spite of these limitations, the comparison of survival rates can be interesting and informative. The data given here refer only to crude survival rates, with no adjustment for recurrences in patients still living.

Cancer of Uterine Cervix

Table 3 shows, for patients treated in each hospital-size group, the stage of cervical tumors

Table 3. Number of cases of cervical cancer reported by hospitals and percent treated surgically, by stage of disease and size of hospital where patient was treated, Connecticut, 1935-51¹

Stage of disease and treatment	Total cases reported by hospitals	Hospital size (beds)		
		Fewer than 200	200 to 350	More than 350
Confined to cervix:				
Radiation only-----	1,084	161	241	661
Surgery only-----	190	43	54	88
Radiation and surgery-----	173	27	65	75
Percent receiving surgery ² -----	25	30	33	20
Regional extension:				
Radiation only-----	811	117	160	518
Surgery only-----	27	6	7	13
Radiation and surgery-----	46	7	15	22
Percent receiving surgery ² -----	8	10	12	6
Remote extension or metastases:				
Radiation only-----	384	39	88	252
Surgery only-----	10	3	4	3
Radiation and surgery-----	13	3	4	6
Percent receiving surgery ² -----	6	13	8	3
Cases with stage reported, untreated or treated elsewhere-----	200	278	258	292
Cases with stage not reported-----	70	13	26	51

¹ Excludes patients with unknown stage or unknown treatment. Treatment includes only radiation or surgery directed against the primary site of the tumor.

² Alone or in combination with radiation.

falling into three broad treatment categories. The stage classification used corresponds roughly to the League of Nations stage system (6) with stages III and IV pooled as "remote extensions or metastases." In each of the three hospital groups, the majority of patients were treated with radiation. However, the proportion treated by surgery, either alone or in combination with radiation, depended to a great extent on both tumor stage and hospital size. Surgery was used more frequently for localized tumors than for those which had extended beyond the cervix. In all three stage groups, the small and intermediate hospitals used surgery more often than the large hospitals. This asso-

ciation between treatment and size of hospital seems to be related to the limited radiation facilities available in the smaller institutions.

Table 4 shows, separately for small, intermediate, and large hospitals, the followup status and estimated 5-year survival rates by stage for cervical cancer patients. The survival rate for localized tumors was 61 percent, and there was little variation among the hospital groups. Patients with remote extensions or metastases had an estimated 5-year survival rate of only 13 percent, and again there was little variation from one hospital group to another. However, sur-

Table 4. Survival rates of patients with cervical cancer reported by hospitals to Connecticut Tumor Registry, by stage of disease and size of hospital where patient was treated, 1935-51¹

Stage of disease	Total cases reported by hospitals	Hospital size (beds)		
		Fewer than 200	200 to 350	More than 350
All stages -----	2,751	408	641	1,643
Survived-----	1,143	162	254	700
Died-----	1,510	232	356	894
Lost-----	98	14	31	49
Estimated 5-year survival rate (percent)-----	44	42	43	45
Tumor confined to cervix -----	1,457	233	362	828
Survived-----	825	127	200	482
Died-----	566	93	142	315
Lost-----	66	13	20	31
Estimated 5-year survival rate (percent)-----	61	59	60	62
Regional extension -----	884	130	182	553
Survived-----	267	30	43	184
Died-----	588	99	131	351
Lost-----	29	1	8	18
Estimated 5-year survival rate (percent)-----	33	24	26	36
Remote extension or metastases -----	410	45	97	262
Survived-----	51	5	11	34
Died-----	356	40	83	228
Lost-----	3	0	3	0
Estimated 5-year survival rate (percent)-----	13	11	12	13

¹ Excludes untreated patients and those with stage not reported. Totals are slightly larger than totals in table 3 because table 3 excludes treated patients for whom the method of treatment was not given.

Table 5. Five-year survival rates after treatment of patients with cervical tumor first diagnosed at small and intermediate-sized hospitals,¹ by stage² of disease and place of treatment, Connecticut, 1935-51

Stage of disease	Percent survival of patients treated in hospitals with—	
	Fewer than 350 beds	More than 350 beds
Confined to cervix-----	60	64
Regional extension-----	26	41
Remote extension or metastases-----	12	20

¹ Fewer than 350 beds.

² Excludes patients with cervical tumors of unknown stage.

vival of patients with regional extensions of cancer was 36 percent in the large hospitals, a considerable increase over the 24 percent and 26 percent rates for the small and intermediate hospitals.

Table 5 gives survival rates by place of treatment for patients having the diagnosis first made in the small or intermediate-sized hospitals. These data show that, stage by stage, cases referred from smaller to larger hospitals for treatment had better prognoses than those treated at the original institutions. The difference is particularly striking for patients with regional extensions of cervical cancer. This may be due to a correlation between the efficacy of treatment and hospital size, or within each stage it may be due to the referral of patients with better than average prognoses.

This last hypothesis is supported by the observation that the entire group of patients with regional extensions of cervical cancer treated in the larger hospitals had a survival rate of 36 percent (table 4), compared with a survival rate of 41 percent for the subgroup of patients referred to the larger hospitals for treatment (table 5). There is a similar difference in survival rates for treated patients with remote extensions or metastases (13 vs. 20 percent) and a smaller difference for patients with localized tumors (62 vs. 64 percent).

If this difference in survival rates were due to

the superior quality of treatment in the large hospitals, it might be expected that the large institutions would have higher 1- or 2-year survival rates for patients in each of the three stage groups, even though the 5-year survival rates for localized and advanced cases are the same in all hospital-size groups. That is, it might be expected that the large hospitals would be able to delay some deaths from cancer substantially longer than the smaller hospitals, even though the deaths cannot be prevented. However, examination of this hypothesis showed that the short-term survival rates in the large hospitals were not significantly higher than those in the small or intermediate hospitals.

Incidence and survival were also examined in relation to the marital status of patients. In the State as a whole, only 3.8 percent of cervical

Table 6. Number of cases of cancer of corpus and unspecified uterus reported by hospitals and percent treated surgically, by stage of disease and size of hospital where patient was treated, Connecticut, 1935-51.¹

Stage of disease and treatment	Total cases reported by hospitals	Hospital size (beds)		
		Fewer than 200	200 to 350	More than 350
Confined to corpus:				
Radiation only	356	61	90	200
Surgery only	793	224	206	351
Radiation and surgery	600	84	164	344
Percent receiving surgery ²	80	83	80	78
Regional or remote extension, or metastases:				
Radiation only	160	24	39	94
Surgery only	93	30	17	42
Radiation and surgery	88	7	19	60
Percent receiving surgery ²	54	61	48	52
Cases with stage reported, untreated or treated elsewhere	197	145	130	165
Cases with stage not reported	71	20	8	44

¹ Excludes patients with unknown stage or unknown treatment. Treatment includes only radiation or surgery directed against the primary site of the tumor.

² Alone or in combination with radiation.

Table 7. Survival rates of patients with cancer of corpus and unspecified uterus reported by hospitals to Connecticut Tumor Registry, by stage of disease and size of hospital where patient was treated, 1935-51.¹

Stage of disease	Total cases reported by hospitals	Hospital size (beds)		
		Fewer than 200	200 to 350	More than 350
All stages	2,095	430	537	1,093
Survived	1,129	230	315	572
Died	846	168	199	461
Lost	120	32	23	60
Estimated 5-year survival rate (percent)	59	60	62	57
Tumor confined to uterus	1,752	369	461	897
Survived	1,046	215	298	524
Died	597	124	144	320
Lost	109	30	19	53
Estimated 5-year survival rate (percent)	65	66	68	63
Regional or remote extension, or metastases	343	61	76	196
Survived	83	15	17	48
Died	247	44	55	141
Lost	13	2	4	7
Estimated 5-year survival rate (percent)	26	26	24	27

¹ Excludes untreated patients and those with unknown stage. Totals are slightly larger than totals in table 6 because table 6 excludes treated patients for whom the method of treatment was not given.

cancer patients had never been married; the corresponding figure for corpus cancer was 14.0 percent. There were no significant variations between hospital-size groups in these proportions. Survival rates for unmarried patients with either form of uterine cancer were below the corresponding rates for married patients but did not show any significant correlation with hospital size.

The data at hand do not permit an evaluation of the effects of several other important variables on survival. During the years under review tumor clinics were established in most Connecticut hospitals. It seems unlikely that these clinics caused any substantial increase in the proportion of early diagnoses of cervical cancer (table 1), but they may have influenced

survival rates in less direct ways. During the war years there were severe shortages of physicians and hospital beds in some areas of the State. These shortages may have changed practices in the referral of cancer patients, thus raising or lowering survival rates in various institutions. At some times and places during the years of the study, radiation facilities were inadequate or unavailable; this also may have influenced referral practices and survival rates.

Because of the difficulties involved in comparing survival rates, one can only speculate on the reasons for the variations in survival of patients with regional extensions of cervical cancer. The differences seem too great to be explained by variations in general treatment policies (table 3). It would be rash to assume that large hospitals are uniformly better than smaller hospitals; nevertheless, it seems reasonable that the probability of survival for patients treated in any given institution should depend on the facilities and staff available. The pattern of survival rates for this series of patients is consistent with the hypothesis that there is a large group of patients having relatively favorable prognoses which do not depend greatly on the exact methods or techniques of treatment; that there is a smaller group of patients with advanced cancer who have poor prognoses regardless of treatment; and that the intermediate group with regional extension is the only one which derives substantial benefit from the more extensive facilities and the greater training and experience of the physicians at the large hospitals.

Cancer of Uterine Corpus

The distribution of patients with cancer of the uterine corpus by stage and treatment is given in table 6. A comparison with table 3 shows that surgery was much more frequently used for corpus tumors than for cervical tumors, whether the cancer was confined to the site of origin or had extended into other tissues. For corpus as well as for cervical cancer, surgery was more commonly used in the smaller than in the large hospitals; this difference was found in all stage groups.

Table 7 shows the survival rates by tumor stage and hospital size for corpus cancer patients. A comparison with table 4 shows that

survival rates were distinctly higher after treatment for corpus cancer than after treatment for cervical cancer, although the survival of patients with localized tumors was approximately the same for the two sites (65 and 61 percent respectively). The number of tumors extending beyond the uterus was too small to permit further subdivision by stage. Although the intermediate hospitals had the best overall survival rate for corpus cancer, stage-by-stage variations among the hospital groups were small and did not form the consistent pattern seen in the cervical cancer data. The lack of association between hospital size and corpus cancer survival rates emphasizes the dissimilarity of these two forms of uterine cancer. Data on survival by place of diagnosis, similar to table 5 for cancer of the cervix, are not given here, but they show no clear relation between size of hospital and 5-year survival.

Summary

From 1935 through 1951, 6,220 patients with malignant tumors of the uterus were reported to the Connecticut Tumor Registry. Data on these patients have been analyzed statistically for small, intermediate, and large hospitals. Among the hospital groups there were no significant differences for cancer of either cervix or corpus in the age of patients or the stage of cancer at the time of diagnosis. There were also no significant differences in the duration of symptoms of cervical cancer from one hospital group to another, but for corpus cancer the small hospitals admitted a higher proportion of patients with relatively short histories than did the large institutions. In general, the differences in characteristics of patients admitted to small, intermediate, and large hospitals were not striking.

In all hospital-size groups, most cervical tumors were treated with radiation alone, while most corpus tumors were treated with surgery, either alone or in combination with radiation. Survival rates of corpus cancer patients did not seem to depend upon the size of the hospital in which they were treated. There was no association between hospital size and survival rates for cervical cancer patients with localized tumors, or for those with remote extensions or metastases. For cervical cancer patients with re-

gional extensions, however, survival rates in the large hospitals were considerably higher than those in the small or intermediate hospitals.

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Medical Self-Help Training Program

A new program to train the American people to care for their own health needs if deprived of a physician's services in a national emergency was formally introduced to health professions in October 1961 by the Public Health Service's Division of Health Mobilization in cooperation with other Federal agencies with civil defense responsibilities and the American Medical Association. The training course will be made available to the public through State and local health, civil defense, and education authorities and medical societies.

The medical self-help training course contains the basic information a person needs in order to preserve life and health under an attack situation and assumes that those affected will have to care for themselves by dint of their own ingenuity and with the resources they have on hand at the moment of disaster.

The program consists of two parts: a reference manual for emergency health care in the home and a formal training course. A training kit contains all materials needed for instruction.

Subject matter of the reference manual, "Family Guide—Emergency Health Care," parallels the training course lessons. The subjects are: radioactive

fallout and shelter; hygiene, sanitation, and vermin control; water and food; shock; bleeding and bandaging; artificial respiration; fractures and splinting; transportation of the injured; burns; nursing care of the sick and injured; infant and child care; and emergency childbirth.

The initial distribution of the manual is being restricted to professional health, civil defense, and educational personnel for evaluation of the material prior to its release to the general public.

To acquaint these professional groups with the training program, a medical self-help workshop was held in October 1961 in Brooklyn, N.Y., another will be held in November in Alameda, Calif., and a third in December in Battle Creek, Mich. The approximately 100 persons attending each workshop will obtain training kits for instituting courses in their respective States. Subsequently, kits will be available for distribution throughout the country.

State administration of the program will be under the direction of a Medical Self-Help Training Committee comprised of the State's health officer, civil defense director, and chief school officer and representatives of the State medical society.

The City Health Department Statistician

HOWARD WEST, M.P.H.

THE American Public Health Association's most recent "Directory of Public Health Statisticians" (1958) lists for 45 cities in the United States the names of one or more persons actively engaged in the "collection, processing, analysis or publication of public health statistics, including vital statistics and medical statistics." Superficial analysis of the directory indicates that for 19 of these cities "statistical" activities revolved principally around vital records, since only a registrar is listed. Apparently, only 26 cities in the United States, 9 of which are in California, have a statistician concerned with public health programs in addition to vital records.

These few facts clearly indicate that in most city health departments the statistician has no direct role. It seems fair to assume that, in general, data are available in these cities mainly as a result of State vital statistics tabulations, State requirements with regard to reportable diseases, Federal requirements with regard to grant funds, and as a result of counts of inspection, nurses' visits, clinic visits, and the like. While this array of data may add up to the kind of information which can occasionally be used effectively to justify budget increases, it is unlikely to be sufficient in scope or detail either to define the complex health needs of a community or to measure the effectiveness of the health department in meeting these multiple needs.

Although the great majority of cities apparently operate without benefit of the skills

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of the statistician, some, recognizing the importance and value of birth and death data, employ a registrar of vital statistics. A registrar increases the likelihood that the city can both gain maximum use of the information and carry on more effectively the unending efforts to improve the completeness and accuracy of these records.

The Lone Worker

The 1958 APHA "Directory of Public Health Statisticians" lists more than one statistician for only nine cities, outside California. While mere numbers are unrelated to the quality of work, they are related to the scope and quantity of work possible. In eight cities, the lone statistician has the entire burden of planning and directing the collection and processing of data as well as of analyzing results and making them available in usable form. The time needed to accomplish these fundamental statistical procedures as they apply to the regular programs of a city health department almost precludes statistical approach to other questions. While it is theoretically possible for one person to undertake both this basic statistical work and occasional field surveys or even sample studies, it is rather unlikely that he will. Aside from the factor of time, the solitary statistician would need for such a program not only well-rounded public health education but also broad experience coupled with resourcefulness and imagination. With such qualifications, it is unlikely he would long remain immune to the enticements of positions with a more promising financial and professional future.

With some exceptions, the solitary statistician probably will not be able to accomplish

more than the development and maintenance of essential information describing health department activities, such as the number of various types of immunizations given, the number of venereal disease cases reported by sex, race, age, and the number of contacts brought to treatment. To be sure, the development of reasonably consistent, accurate, and timely data to describe the varied efforts of the average city health department is a feat greatly to be admired, even envied.

Opportunities for Special Projects

The health departments having more than one statistician are, with one exception, in cities of more than 500,000 population. Three of them are independent of a State health department, and thus are entirely responsible for the vital statistics and for the development of all other statistics necessary to the various activities of the health department. The struggle to provide useful basic activity data is not unlike that in cities having fewer resources. But efficiency is likely to be higher, not only because larger staffs provide an opportunity for some specialization, but because the tools are likely to be better. Such health departments usually have a full complement of punchcard equipment available to them. More advanced tools and larger staffs also provide some flexibility in the extent and scope of the statistical program. Although there is constant need to provide basic activity data and to refine and improve their meaning and usefulness, there may also be opportunity for nonrepetitive projects.

In the District of Columbia Department of Public Health, where we have had three, sometimes four, statisticians during the past 6 years, most of our time has been spent on development of valid and useful repetitive data. These efforts are never ending, even for vital statistics, where experience is long and methodology well developed. We have strived also to gather a large variety of data useful for population estimates, to refine and further develop appropriate methodology, and to prepare annual estimates by age and race.

The statistician is needed also for a variety of nonrepetitive projects of surprising range and scope. In Washington, D.C., for example,

income requirements for eligibility for hospital care had become out of date. How were the income scales to be adjusted so as to eliminate inequities and at the same time not make more persons eligible than could be cared for at city expense? A citywide income survey (1) with defined sampling error was determined upon; the necessary funds were obtained; criteria, content, and tabulation details were specified for the Bureau of the Census, which selected the sample, carried out the field interviews, and processed the results. The income tabulations were analyzed and used in developing and recommending adjustments in income requirements for eligibility which have proved to be within fiscal and facility limitations.

As another example, the neonatal mortality rate reached a low point in Washington about 10 years ago. Since that time it has risen somewhat. While the effect of changes in such factors as race and legitimacy can be accounted for, other factors which may have affected this mortality rate, such as changes in the amount and duration of prenatal care, require research. Revisions of the extensive medical items on the birth certificate will soon make available data of sufficient detail to provide useful measures of the effectiveness of the department's greatly stepped-up prenatal care program as well as potential clues for further research.

The rapid advances in the development of automatic data-processing equipment must in time have an impact on the larger city health departments. These powerful new tools make possible the development of much significant information not now available as well as more extensive use of existing information. The statistician must be prepared to participate, if not to lead, in evaluating the potentials for new program data as well as for data which may be available as a byproduct of financial or other administrative information. He must also be prepared to develop the necessary procedures and programs for the equipment once it is available.

Effects of Program Budgeting

Program budgeting, a concept developed about a dozen years ago and now filtering down

to municipal governments, has begun to affect the role of the statistician in city health departments. In contrast to the traditional method of budgeting for each unit independently of the others, this new budget pattern recognizes the operational interdependence of the various organization units. It has also led directly to an entirely different perspective toward program operation and costs. These new approaches have in turn contributed to increased emphasis on program planning and evaluation.

In each of the three cities known to be using program budgeting, a statistician has been given the primary responsibility for program planning, evaluation, and research. And in each of these cities, these functions have been divorced from those of collection, processing, analysis, and publication of public health and vital statistics.

In this new role, all the training, knowledge, and skills of the public health statistician are being called upon as never before. He needs to be familiar with the numerous and complicated characteristics of his city—its people, its neighborhoods, its resources, both human and physical, its economy—in short, all its attributes, its problems, and its deficiencies. By one means or another data must be obtained which will provide the best possible statistical description of all of these. Against this backdrop, the health needs of the community must be fully determined in detail. In addition to health department, hospital, welfare department, and community agency data, the invaluable reports coming from the National Health Survey, as well as other nationally developed urban data, will need to be synthesized to reach a reasonably clear picture of community health needs.

The city health department is meeting various portions of some of these health needs. For almost none of them can or does it attempt to do the whole job. Numerous other agencies and the practicing private physician also are responsible for providing for the health needs of the community. The distribution of these responsibilities must be identified, and those segments for which the health department has responsibility and those which no group or agency has actively undertaken must be noted particularly. As the latter are identified, the

question of whether the health department should begin to plan to fill these gaps will need to be answered.

Statistics in Evaluation

How successfully is the health department meeting its defined role in the community? Its statistical program should be able to provide data which will describe the extent to which the department is meeting the needs for which it has responsibility.

How do these accomplishments measure up to its budgeted and staffed plans to achieve projected goals? What are the gaps between accomplishments, plans, and needs? The effectiveness with which the department's programs are carried out must be differentiated from how well those programs actually satisfy community health needs. For example, is a significant increase in the proportion of women who are provided adequate prenatal care by the health department's prenatal clinics reflected by a significant increase in the proportion of women having adequate prenatal care who are delivered at the city hospital? Or did the increase at the clinics merely represent a shift in use of facilities?

The answers to such questions, as they apply to appropriate segments of the numerous programs of the department, provide an approach to evaluation of their effectiveness. And while careful evaluation may indicate the need for program modification, research is frequently required to provide the basis for valid modification. In the example just given, assume that the increase in adequate prenatal care provided by the clinics did in fact represent nothing more than a shift away from previous care patterns. What factors or combination of factors caused the shift? What combination of factors is needed to achieve a net gain in total prenatal care? These can be answered only by specific research. Program evaluation provides a means for defining problems, and research the means for attempting to solve them effectively. The statistician must inevitably play a major part both in the development of evaluation techniques and in the formulation of research projects to improve and enhance health department programs.

The APHA, through its Program Area Committee on Public Health Administration, will soon release for field testing a completely revised evaluation schedule for local health departments. This comprehensive document will require detailed definition of community health needs and program objectives, development and use of program measurements, evaluation studies, and identification of specific research needs. The hoped-for stimulation of local health department efforts along these lines will be difficult to accomplish unless the statistician is available and enabled to make his appropriate contribution.

Four Stages of Development

The role of the statistician in city health departments today reflects four stages of development of statistical programs in the public health movement. Most of our city health departments are in stage one. These departments have recognized the importance of vital records and of the contribution that a registrar can make to the correct recording and use of vital records data. In stage two are those health

departments which have accepted the concept that a statistician can make a contribution to the health program, but which apparently cannot afford to develop fully their basic statistical program. In stage three are found those larger cities which not only have greater resources, but which have also recognized the need for statistical staff in order to maximize the availability and usefulness of a wide variety of program data. Stage four reflects the recognition of the statistician not only in his role as a data producer and analyst, but as an objective and skilled interpreter of health problems and needs. In this new role, the statistician is assuming staff responsibility for planning, evaluation, and research in public health programs. The challenge of these broad responsibilities is great, but greater still is the potential significance of these developments to progress in public health.

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Electronic Larynx

An electronic artificial larynx has been developed for persons who have lost the power of speech because of paralysis or surgical removal of the larynx. When the instrument is held against the side of the throat, the sound waves it generates pass into the throat cavity and are formed into speech by the lips and tongue. The electronically produced sound waves thus replace those normally produced by air passing over the vocal cords.

The pocket-sized instrument uses transistors and is powered by self-contained mercury batteries. It is available with a high pitch for women and a low pitch for men. The pitch may be varied to produce inflections over a half an octave by depressing a switch. Speech



volume is equivalent to that of a normal talker speaking at a conversational level.

The device was developed and is being sold at manufacturing cost by the Bell Telephone System.

Primary and Secondary Syphilis in the United States

NORMAN W. AXNICK, M.S., and WILLIAM J. BROWN, M.D.

THE REPORTED incidence of primary and secondary syphilis in the United States continued to increase sharply and steadily during the 1959 and 1960 fiscal years following a slight increase in 1958. The increase continued in the first 9 months of fiscal year 1961; 14,019 cases of primary and secondary syphilis were reported during that period. Prior to 1958, a level trend appeared to be developing in the United States following the continuous decline from the postwar peak year of 1947 with the advent of mass penicillin chemotherapy. Figure 1 compares the trend of primary and secondary syphilis and gonorrhea case rates in the United States during fiscal years 1941 through 1960. The reported incidence rate of gonorrhea has only increased moderately during 1959 and 1960 in comparison with the increase in the reported incidence rate of primary and secondary syphilis.

Venereal disease control personnel are confronted with the implications of the reported level of 12,000 cases in 1960 to a projected 19,000 cases in 1961 in the United States. What do the reported increases mean in terms of the present control program and what additional control measures are needed? Some statistical data on a national scope related to this situation are presented in this report.

Source of Morbidity Reports

Morbidity reports are received from private physicians as well as from health department-sponsored clinics, hospitals, and other non-health department institutional facilities, since primary and secondary syphilis are reportable in every State.

While it is recognized that morbidity reporting practices vary from State to State and under-reporting definitely occurs, private physicians reported about 36 percent of the primary and secondary syphilis morbidity in the United States in fiscal year 1960. In more detail, 39 percent of the male primary and secondary syphilis morbidity and 29 percent of the female primary and secondary syphilis morbidity were reported by private physicians. It is difficult to determine the extent of improvement in morbidity reporting by private physicians without baselines, which at present are not available in most States. However, the percentage increases in reported cases of primary and secondary syphilis were approximately the same from both reporting sources in 1959 and 1960 in the United States (table 1).

Geographic Distribution

The geographic distribution of reported primary and secondary syphilis cases per 100,000 population in the fiscal years 1958-60 is shown in table 2. The continuous increases in case rates in States which already were experiencing a high level of infectious syphilis, and subsequently the States on their peripheries, suggest that an actual increase in the incidence of the disease occurred along with possible improvement in reporting of cases (fig. 2).

During the 1958-60 period, reported case rates continued to increase significantly for 2 con-

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secutive years in Louisiana, New York, Tennessee, Alabama, California, New Jersey, Washington, North Carolina, and Pennsylvania. In 1960, nine additional States—Arizona, Florida, Illinois, Texas, Virginia, Oregon, Michigan, Minnesota, and Ohio—reported significant increases in primary and secondary syphilis morbidity over the previous year.

A simple approximation assuming a Poisson probability distribution was used to estimate the error in the tests of significance (1). Differences between rates were regarded as significant at the 5 percent level with nonindependence limitations.

In many States which reported increases in infectious syphilis, most of the morbidity was reported from the large urban centers. Primary and secondary syphilis case rates for cities with 200,000 population and over in the 1950 census for fiscal years 1958–60 are presented in table 3.

The eight cities reporting significant increases in reported primary and secondary syphilis in-

Table 1. Primary and secondary syphilis cases, by reporting source, United States, 1954–60

Fiscal year	Private physicians	Clinics, hospitals, other institutions	All sources
1954.....	3,401	4,287	7,688
1955.....	2,968	3,548	6,516
1956.....	2,918	3,839	6,757
1957.....	2,573	3,678	6,251
1958.....	2,466	4,195	6,661
1959.....	3,110	5,068	8,178
1960.....	4,710	7,761	12,471

cidence for 2 consecutive years during the 1958–60 period are coastal cities, with the exception of Washington, D.C. Among these cities, in 1960, Miami had the highest primary and secondary syphilis case rate, with 64 cases per 100,000 population. Ranking next were New Orleans, Washington, D.C., Newark, New York City, Los Angeles, Seattle, and Philadelphia. These cities accounted for one-third of the pri-

Figure 1. Primary and secondary syphilis and gonorrhea cases per 100,000 population, United States, fiscal years 1941–60

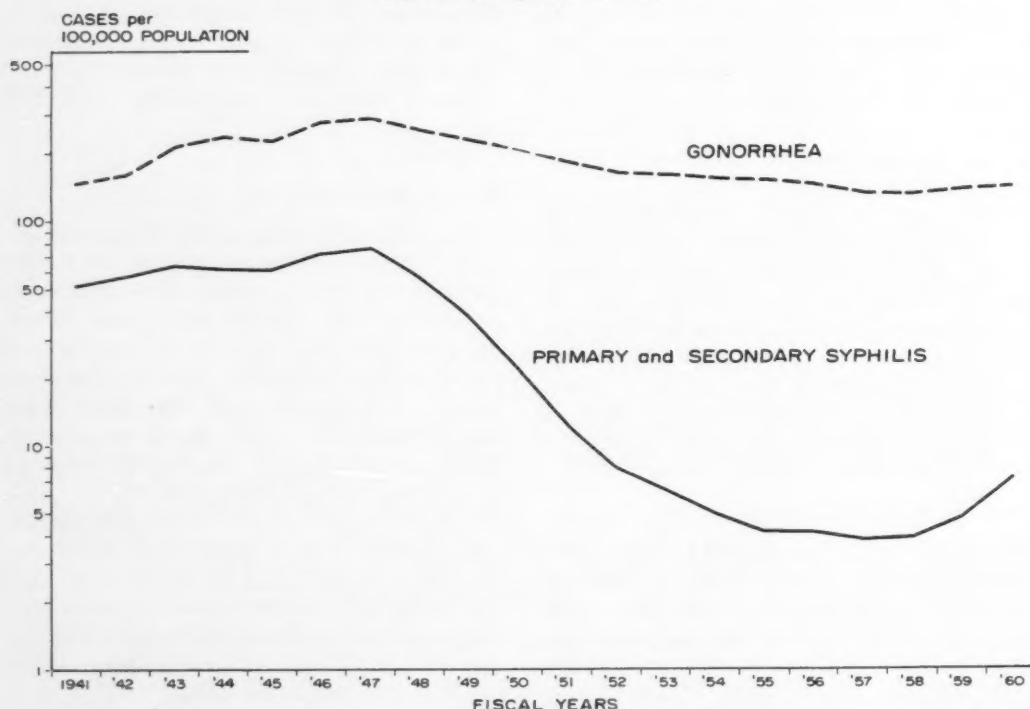


Table 2. Primary and secondary syphilis reported by State health departments during fiscal years, 1958-60

States	1958		1959		1960	
	Cases	Rate ¹	Cases	Rate ¹	Cases	Rate ¹
United States.....	6, 661	3. 9	8, 178	4. 7	12, 471	7. 1
Alabama.....	179	5. 7	252	7. 9	317	10. 0
Alaska.....	4	2. 4	3	1. 8	4	2. 5
Arizona.....	84	7. 6	98	8. 8	200	16. 5
Arkansas.....	154	8. 8	214	12. 2	194	11. 2
California.....	611	4. 5	904	6. 5	1, 209	8. 4
Colorado.....	32	2. 0	30	1. 8	32	1. 9
Connecticut.....	50	2. 2	70	3. 0	80	3. 3
Delaware.....	22	5. 1	48	10. 8	35	7. 8
District of Columbia.....	150	18. 5	194	24. 1	472	57. 6
Florida.....	207	5. 2	246	5. 7	450	9. 6
Georgia.....	649	17. 6	757	20. 2	740	19. 6
Hawaii.....	2	. 4	14	2. 4	5	. 8
Idaho.....	11	1. 7	1	. 2	7	1. 1
Illinois.....	577	6. 0	642	6. 5	936	9. 2
Indiana.....	87	1. 9	83	1. 8	82	1. 8
Iowa.....	18	. 6	14	. 5	13	. 5
Kansas.....	13	. 6	61	2. 9	61	2. 9
Kentucky.....	61	2. 0	60	2. 0	82	2. 7
Louisiana.....	62	2. 1	246	8. 0	685	21. 8
Maine.....	5	. 5	1	. 1	4	. 4
Maryland.....	277	9. 8	238	8. 2	272	9. 2
Massachusetts.....	256	5. 3	245	5. 1	225	4. 6
Michigan.....	83	1. 1	79	1. 0	146	1. 8
Minnesota.....	15	. 5	28	. 8	50	1. 5
Mississippi.....	69	3. 2	76	3. 5	94	4. 3
Missouri.....	63	1. 5	74	1. 7	92	2. 2
Montana.....	6	. 9	18	2. 6	21	3. 1
Nebraska.....	5	. 4	2	. 1	17	1. 2
Nevada.....	8	3. 1	8	3. 1	14	5. 1
New Hampshire.....	8	1. 4	2	. 4	3	. 5
New Jersey.....	102	1. 8	279	4. 9	435	7. 4
New Mexico.....	68	8. 5	59	7. 2	41	4. 8
New York.....	908	5. 7	1, 192	7. 4	2, 359	14. 3
North Carolina.....	176	4. 0	237	5. 3	288	6. 5
North Dakota.....	4	. 6	2	. 3	9	1. 4
Ohio.....	141	1. 5	97	1. 0	135	1. 4
Oklahoma.....	45	2. 0	70	3. 1	58	2. 6
Oregon.....	23	1. 3	16	. 9	68	3. 9
Pennsylvania.....	129	1. 2	242	2. 2	434	3. 8
Rhode Island.....	4	. 5	7	. 8	9	1. 1
South Carolina.....	403	17. 5	274	11. 7	282	11. 9
South Dakota.....	5	. 7	10	1. 5	21	3. 1
Tennessee.....	173	5. 0	235	6. 8	394	11. 3
Texas.....	434	4. 9	445	4. 8	862	9. 2
Utah.....	10	1. 2	13	1. 5	5	. 6
Vermont.....	2	. 5	5	1. 4	5	1. 3
Virginia.....	136	3. 7	158	4. 2	242	6. 3
Washington.....	22	. 8	54	2. 0	182	6. 6
West Virginia.....	35	1. 8	33	1. 7	27	1. 4
Wisconsin.....	75	1. 9	54	1. 4	70	1. 7
Wyoming.....	4	1. 3	2	. 6	3	. 9

¹ Per 100,000 population.

mary and secondary syphilis cases reported in the United States.

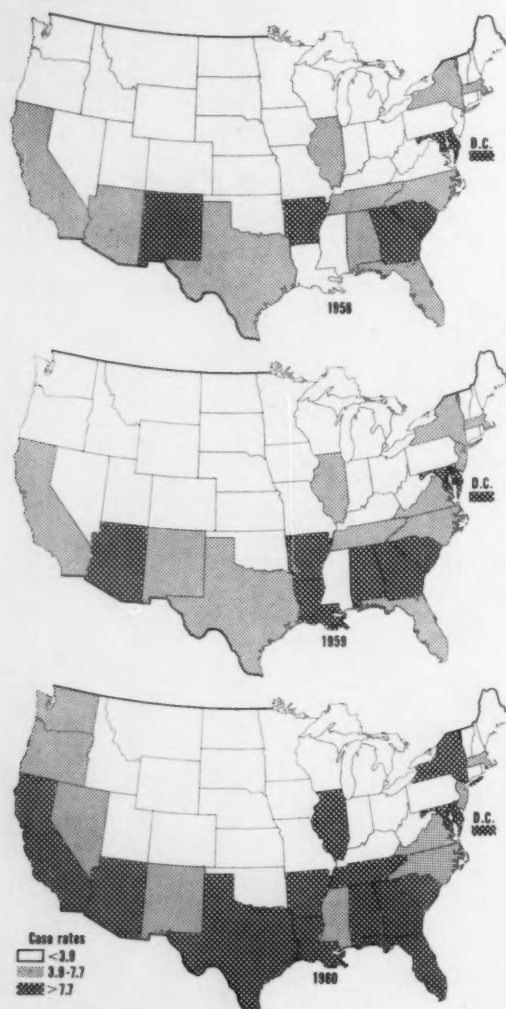
In 1960, 13 additional cities reported significant increases in primary and secondary syphilis morbidity over the 1959 fiscal year morbidity. These were Houston, Atlanta, Dallas, Chicago, Jacksonville, Richmond, Fort Worth, Long Beach, Birmingham, Portland, Kansas City (Mo.), Detroit, and Cleveland.

These pronounced, widespread geographic increases in reported incidence seem to indicate

that the increase in the number of cases cannot be ascribed only to any isolated increased interest or improvement in reporting of private physician cases in these stages of the disease.

Canada reports a similar abrupt rise in the incidence of primary and secondary syphilis in 1959 (2). The increase in the Western Provincial Health Areas of British Columbia and Alberta coincides with the increases reported in the States of Oregon and Washington in the United States.

Figure 2. Primary and secondary syphilis cases per 100,000 population, United States, fiscal years 1958, 1959, and 1960



Age and Sex

Since interest has been focused on teenage and young adult incidence, morbidity data have been reported to the Public Health Service by age and sex (3).

In 1959, consistent increases in primary and secondary syphilis cases occurred in all age groups. The largest increases occurred in the age groups 20-24, 25-29, and 30-34 years among males and in the groups 15-19, 20-24, and 25-29 years among females. An excess of male over female morbidity prevails in all age groups except in those less than 20 years old.

Overall, the increases have been greater among males than among females. Since 1956, the male-to-female ratio of primary and secondary syphilis cases reported by private physicians and clinics has been increasing steadily in the United States (table 4). Further epidemiologic studies are needed to determine the reasons for the increase in the male-to-female ratio of primary and secondary syphilis cases.

Casefinding

Casefinding activities include contact tracing of private and public patients, cluster testing (testing of suspects named by patients and associates of patients or their contacts), selective mass testing, and the followup of positive serologic tests for syphilis from public and private laboratories.

Figure 3 shows the number of primary and secondary syphilis cases brought to treatment as a result of casefinding activities in the United States for the 1954 through 1960 period. In 1960, about one-half of the primary and secondary syphilis cases reported in the United

Table 3. Primary and secondary syphilis reported by health departments in cities with population of 200,000 or more,¹ fiscal years 1958-60

City	1958		1959		1960	
	Cases	Rate ²	Cases	Rate ²	Cases	Rate ²
Akron.....	11	3.67	10	3.29	23	7.42
Atlanta.....	68	12.62	60	10.93	164	29.39
Baltimore.....	233	23.90	199	20.35	179	18.17
Birmingham.....	27	7.42	16	4.38	43	11.72
Boston.....	148	19.60	137	18.46	102	10.36
Buffalo.....	15	1.43	29	2.68	27	2.43
Chicago.....	526	13.74	584	15.23	832	21.60
Cincinnati.....	11	2.01	4	.73	15	2.70
Cleveland.....	22	2.32	16	1.69	33	3.46
Columbus.....	5	1.16	17	3.76	8	1.71
Dallas.....	69	11.06	41	6.36	182	27.20
Dayton.....	18	6.29	11	3.77	3	1.01
Denver.....	11	2.16	22	4.25	18	3.41
Detroit.....	25	1.29	35	1.79	78	4.00
Fort Worth.....	22	5.95	24	6.19	49	12.28
Honolulu.....	2	.69	12	3.90	5	1.53
Houston.....	143	19.54	196	21.54	350	37.96
Indianapolis.....	48	10.71	46	10.20	32	6.91
Jacksonville.....	35	15.35	25	10.82	43	18.30
Jersey City.....	20	6.62	22	7.28	23	7.62
Kansas City.....	11	2.23	8	1.61	40	7.69
Long Beach.....	5	1.63	3	.96	39	12.11
Los Angeles.....	223	9.75	274	11.77	423	17.64
Louisville.....	7	1.21	27	4.57	29	4.94
Memphis.....	40	7.31	81	14.73	36	6.30
Miami.....	40	15.33	90	32.61	192	64.00
Milwaukee.....	23	3.21	25	3.31	34	4.44
Minneapolis.....	10	1.83	4	.72	19	3.41
Newark.....	28	6.21	99	21.81	191	40.90
New Orleans.....	24	3.75	156	23.96	409	62.00
New York.....	802	9.91	1,059	13.60	2,091	26.91
Norfolk.....	23	7.57	37	12.01	48	16.00
Oakland.....	14	1.61	53	6.00	44	6.21
Oklahoma City.....	9	3.10	24	8.08	6	2.00
Omaha.....	4	1.42	1	.34	8	2.64
Philadelphia.....	82	3.76	150	6.79	312	14.14
Pittsburgh.....	27	1.69	37	2.25	50	3.03
Portland.....	6	1.47	9	2.18	39	9.42
Providence.....	4	1.61	4	1.74	5	2.17
Richmond.....	21	8.64	22	9.05	44	18.18
Rochester.....	16	4.60	10	2.87	19	5.49
St. Louis.....	36	4.10	25	2.87	33	3.78
St. Paul.....	1	.30	20	5.92	23	6.71
San Antonio.....	3	.51	1	.16	5	.78
San Diego.....	14	1.60	24	2.65	28	2.97
San Francisco.....	144	17.78	311	38.78	319	39.78
San Juan.....	25	5.47	32	7.00	36	7.88
Seattle.....	14	1.79	36	4.19	127	14.40
Syracuse.....	7	3.00	5	2.34	11	5.14
Toledo.....	3	.90	3	.89	8	2.12
Washington, D.C.....	150	18.54	194	24.13	472	57.63
Worcester.....	2	.96	0	0	0	0

¹ 1950 census.

² Per 100,000 population.

Table 4. Primary and secondary syphilis cases, by reporting source and sex, United States, 1956-59

Calendar year	Private physicians			Clinics			All sources		
	Male	Female	Male-female ratio	Male	Female	Male-female ratio	Male	Female	Male-female ratio
1956	1,696	1,049	1.62	2,359	1,295	1.82	4,055	2,344	1.73
1957	1,634	921	1.77	2,579	1,447	1.78	4,213	2,368	1.78
1958	1,781	824	2.16	3,001	1,578	1.90	4,782	2,402	1.99
1959	2,779	1,019	2.73	4,064	1,936	2.10	6,843	2,955	2.32

States were brought to treatment as a result of the casefinding network.

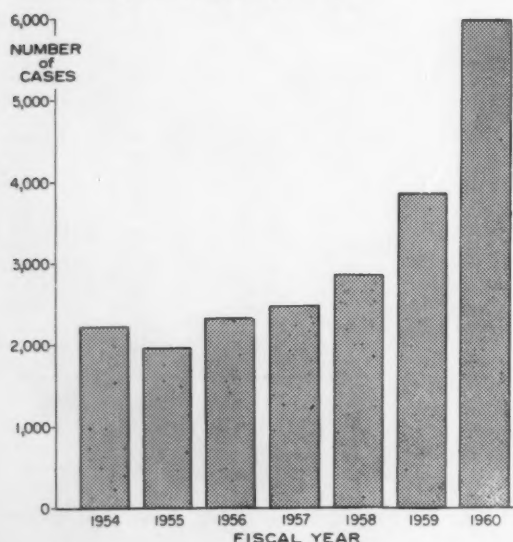
Since 1954, the percentage of primary and secondary syphilis cases brought to treatment involving some facet of casefinding has increased each year. In fiscal years 1959 and 1960 the increase was more pronounced than in previous years. The more intensified contact tracing of private physician infectious syphilis cases (in 1960, 65 percent of the cases reported by private physicians were interviewed), the increased followup of positive serology tests for syphilis from private laboratories, and application of cluster testing to a larger number of primary and secondary syphilis patients contributed largely to this upswing. In 1960, it is estimated

that the additional number of primary and secondary syphilis cases brought to treatment as a result of casefinding efforts was, at a maximum, about one-third to one-half of the national increase in reported primary and secondary syphilis cases.

Additional measures are needed in certain aspects of control programs to hasten an ultimate reduction in the incidence of primary and secondary syphilis in the United States:

- Interview all private patients for sex contacts and apply cluster testing to persons in their social environment.
- Reinterview all private patients for whom no source or spread contacts are identified.
- Extend the followup of positive serologic tests for syphilis to those performed by all private laboratories and hospitals.
- Extend the private physician visitation program to all States and particularly to all large metropolitan areas to strengthen the surveillance of infectious syphilis by private physicians and health departments.

Figure 3. Primary and secondary syphilis cases brought to treatment as a result of casefinding activities, United States, 1954-60



Summary and Conclusions

National data on reported cases of primary and secondary syphilis and on epidemiologic activity have been used as the bases for the following conclusions with respect to the increases and present control measures in these stages of syphilis.

Geographic distribution of reported cases of infectious syphilis by States, cities, and regions of the United States, by year, suggests that there has been an actual increase in the incidence of the disease. The extent of improvement in reporting by private physicians cannot be determined without baselines.

Intensified casefinding activities contributed to the national increase in reported cases of primary and secondary syphilis in the fiscal years 1959 and 1960. Extension of casefinding measures is needed to accelerate an ultimate, significant reduction in the incidence of primary and secondary syphilis.

Such data as have been obtained on reported incidence of primary and secondary syphilis indicate that the increases in the number of cases occurred in all sources of reporting, in all age groups, and for both sexes.

An increasing excess of male cases over fe-

male cases suggests the need for epidemiologic studies on the modes of transmission of syphilis.

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- (2) Canada Department of National Health and Welfare: *Fourteenth semiannual statistical report on the incidence of venereal disease in Canada*. Ottawa, 1960.
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Fellowships for Health Workers

The World Health Organization will provide to U.S. citizens in 1962, at the request of the Government of the United States, a limited number of short-term fellowships in public health and related fields for the "improvement and expansion of health services" in the United States. Applicants must be engaged in full-time public health or educational work. Officers and employees of the U.S. Government are not eligible.

The applications will be screened by a WHO Fellowship Selection Committee established by the Surgeon General. The Committee will consider the ability of the individual, the proposed field of study, and the contribution which foreign study would make after the applicant has returned.

These fellowships will cover per diem and transportation, but except in very unusual circumstances, will be limited to short-term travel of 2 to 4 months. Employers of successful applicants are expected to endorse applications and to continue salary during the fellowship.

The deadline for the receipt of applications is January 1, 1962, but successful applicants probably cannot start their fellowships before May 1, 1962. Further information and application forms may be obtained from Dr. Howard M. Kline, Secretary, World Health Organization Fellowship Selection Committee, Public Health Service, Washington 25, D.C.



MORTALITY FROM INFECTIOUS HEPATITIS

Nationwide mortality data for infectious hepatitis as a separate entity have been available only since 1949. Reporting of cases was not required in many States prior to 1952, although a few reported some data as early as 1947. Infectious hepatitis, caused by type A virus, and serum hepatitis, type B infections, are combined in routine weekly and annual reports of cases. The number of serum hepatitis cases included in the totals is unknown, but it probably constitutes only a small proportion.

Prior to 1949, deaths from infectious hepatitis were included either in a category with Weil's disease or with other diseases of the liver, while those from serum hepatitis were included with other diseases of the liver. In 1949 infectious hepatitis (type A) became a separate category under the general heading of diseases attributable to viruses. Deaths from serum hepatitis have been included with one or the other of two categories which include deaths from certain other causes, and these have not been tabulated or separated from such totals.

A cyclic occurrence has characterized the incidence of reported cases of infectious hepatitis since 1952 (table 1). Annual totals have ranged from a high of 50,000 in 1954 to a low of about 15,000 in 1957. After the peak incidence in 1954 there was a decline for 3 years (fig 1). A rising trend began again in 1958 and has continued to the present time. Mortality from infectious hepatitis (type A only), on the other hand, rose rapidly from 1950 to 1952, but it remained relatively stationary in the following 7 years. No peak in mortality was evident in 1954 when incidence rose to a high peak. The number of deaths from infectious hepatitis has ranged from about 550 to about 900 per year. While these numbers indicate that the infection is not a major cause of death, they are greater at the present time than the numbers for any of the infections listed in the category of diseases attributable to viruses.

Figure 1. Infectious hepatitis: morbidity and mortality, 1949-59

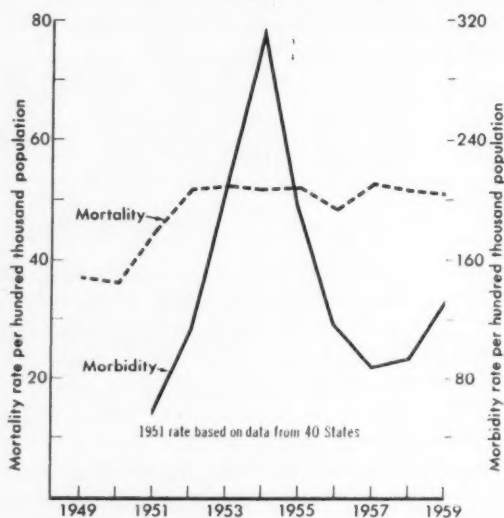
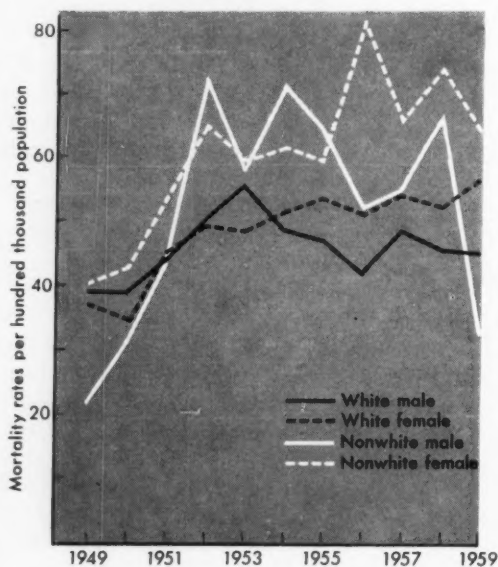


Figure 2. Infectious hepatitis: mortality by sex and race, 1949-59



Certain trends become apparent when mortality rates for infectious hepatitis by age, sex, and race are examined (fig. 2 and table 2). There was a rise in mortality for all groups in the early part of the 11-year period. The rate for white males reached a peak in 1953 followed by a moderate decline. The rate for white fe-

males continued to rise throughout the entire period. The same trends are evident for non-white males and females although their rates were at a higher level than those for white males and females. They also show greater fluctuations from year to year, possibly because of the relatively small numbers of deaths.

Table 1. Infectious hepatitis: morbidity and mortality rates in the United States, 1949-59

Year	Morbidity rates per 100,000 population ¹	Mortality rates per million population ²				
	Total	Total	White males	White females	Nonwhite males	Nonwhite female
1959	133.6	5.09	4.51	5.66	3.20	6.41
1958	94.1	5.18	4.59	5.23	6.68	7.40
1957	87.6	5.26	4.86	5.42	5.43	6.55
1956	116.4	4.88	4.15	5.13	5.16	8.14
1955	196.9	5.18	4.73	5.37	6.46	5.92
1954	314.9	5.15	4.82	5.12	7.15	6.19
1953	216.0	5.26	5.53	4.87	5.74	5.88
1952	113.6	5.17	5.00	4.96	7.25	6.49
1951	³ 58.9	4.46	4.31	4.53	4.29	5.31
1950		3.65	3.85	3.45	3.10	4.20
1949		3.70	3.86	3.69	2.19	3.95

¹ Includes both type A and type B infections.

² Type A infections only.

³ Rate based on data from 40 States.

Table 2. Infectious hepatitis mortality: ¹ average rates per million population by age, sex, and race

Age (years)	1949-50	1951-53	1954-56	1957-59	1949-50	1951-53	1954-56	1957-59
	White males				White females			
All ages	3.85	4.80	4.44	4.71	3.57	4.79	5.21	5.44
Under 5	3.14	3.72	3.05	2.30	2.21	2.69	2.62	2.03
5-14	.73	1.78	1.32	.97	.86	2.06	1.17	1.34
15-24	1.65	1.89	1.45	1.47	2.14	3.21	2.59	2.86
25-34	1.67	2.69	1.75	2.00	2.81	4.16	3.13	4.11
35-44	2.98	3.99	3.75	4.00	4.66	4.27	4.96	4.76
45-64	6.58	7.19	7.30	7.84	5.43	6.46	8.14	9.03
65 and over	13.71	16.46	17.86	19.57	7.42	12.41	16.77	15.08
	Nonwhite males				Nonwhite females			
	1949-50	1951-53	1954-56	1957-59	1949-50	1951-53	1954-56	1957-59
All ages	2.65	5.64	6.13	5.12	4.08	5.89	6.76	6.79
Under 5	2.48	8.63	7.51	5.94	1.50	4.49	3.49	4.32
5-14	.33	2.23	1.74	1.05	.98	2.43	2.62	2.12
15-24	1.62	5.00	6.47	4.06	6.62	4.19	7.04	5.74
25-34	2.57	6.50	4.68	6.05	3.83	5.92	9.11	8.45
35-44	2.83	3.75	4.96	4.86	5.66	8.50	10.16	7.22
45-64	5.05	9.46	10.04	9.89	6.75	8.83	7.29	12.31
65 and over	7.32	3.08	13.68	7.54	3.59	11.21	13.52	13.01

¹ Type A infections only.

The striking feature of the mortality rates by age and sex is the higher rate for females in the age groups from 15 to 44 years. Some decline in mortality is apparent for both white males and white females under 5 years of age, and a rise is evident for each sex and race in the older age groups, 45 to 64 and 65 years and over.

For most infectious diseases, mortality is higher among males. An exception is whooping cough, for which the excess has been apparent for females 10 years of age and over for at least 30 years. Reported morbidity for whooping cough has also been higher among

females, which suggests the possibility of a sex differential in susceptibility to the infection that is different from that for other infectious diseases. A greater amount of exposure to infection in the home may also be a factor. With respect to infectious hepatitis, there are insufficient morbidity and mortality data to test these hypotheses or to determine whether the differences discussed here have existed for longer than a decade.—CARL C. DAUER, *medical advisor, National Center for Health Statistics, Office of the Surgeon General, Public Health Service.*

Narcotic Control

Stricter control of the sale of narcotics and better safeguards for supplies of narcotics are the aims of rules promulgated by Dr. Herman E. Hilleboe, commissioner of the New York State Department of Health.

Among the rules are:

- A prescription for narcotic drugs may be issued only by a physician or other duly registered practitioner.
- The responsibility for the proper prescribing and dispensing of narcotic drugs is with the licensed practitioner. A corresponding responsibility rests with the pharmacist who fills the prescription.
- All prescriptions for narcotic drugs and narcotic preparations must bear the full name and address of the patient and the name, address, and registry number of the prescriber. Each prescription must be dated and signed on the day when issued.
- A prescription for narcotic drugs may be filled only by a licensed, registered pharma-

cist in a pharmacy authorized to sell narcotic drugs at retail.

- Furnishing narcotics on a practitioner's telephone order is prohibited, whether or not signed prescriptions covering such orders are subsequently received. However, in an emergency a pharmacist may deliver narcotics as the result of a telephone order if a prescription is supplied before delivery is made.

As well as listing narcotic drugs and preparations which require prescriptions, the rules require that no more than 4 ounces of cough sirups containing narcotics may be sold to one individual during a 24-hour period.

Rules for the storage and handling of narcotics are provided for manufacturers, wholesalers, laboratories, hospitals, and nursing homes. Responsibility for safeguarding the drugs is placed on the administrative head of each establishment.

Copies of the rules can be obtained from the Bureau of Narcotic Control, New York State Health Department, Albany 8, N.Y.

Anthelmintic Therapy Program in a School Using Two Formulations of Dithiazanine

M. M. BROOKE, Sc.D., FRANCISCO FEBLES, JR., M.D., and MARY BAZEMORE, M.D.

WITH the recent increase in migration of Puerto Ricans to the United States, many schools in some of the larger northern cities have large proportions of Puerto Rican students. In Philadelphia, where approximately 70 percent of these students have been found to have intestinal nematodes (1), consideration has been given to establishing a therapy program against these parasites.

Reports on the broad-spectrum effectiveness of dithiazanine have suggested that it might be suitable for anthelmintic mass therapy in a school program (2-15). The first effective drug against *Trichuris trichiura*, it has been shown also to be effective against *Enterobius vermicularis*, *Strongyloides stercoralis*, and *Ascaris lumbricoides*, and to a lesser degree against hookworm. Although side reactions have been reported, in most instances they have not interfered with the completion of therapy.

In the treatment of outpatients at the parasitosis clinic of the Philadelphia Health Department, it was found that a formulation of dithiazanine designated dithiazanine II, with the longest disintegration time in simulated intestinal fluid, was the least toxic of several formulations (16). Furthermore, this formulation was found to be as effective against *T. trichiura* as the standard commercial dithiazanine, which exhibited more side reactions. Similar results on the relative effectiveness and tolerance of dithiazanine II have been reported by Evans and co-workers (14) and Hammond and McCowen (17). Although the first group of investigators demonstrated that dithiazanine II (which they designated formulation A) was also as effective against hookworm and *A. lumbricoides* as the standard commercial prep-

aration, we doubted that dithiazanine II would have the desired broad-spectrum effect against those organisms located in the upper part of the small intestine. The manufacturer, therefore, developed another formulation, dithiazanine amberlite, which was expected to be more effective against these organisms. Dithiazanine amberlite combines dithiazanine iodide and an inert resin as a means of gradually releasing the active drug throughout the small intestine.

This report presents the results of a school therapy program using dithiazanine II, dithiazanine amberlite, and placebo (A).

Materials and Methods

Through discussion with appropriate school authorities, St. Peter's Elementary School, with

Dr. Brooke is chief of the Microbiology Section, Communicable Disease Center, Public Health Service, Atlanta, Ga. Dr. Febles, at the time of this study, was with the Microbiology Section on assignment to the Philadelphia Department of Public Health as the medical officer in charge of the parasitosis clinic, Health District No. 6. He is now at the Puerto Rico Field Station of the Communicable Disease Center, San Juan. Dr. Bazemore is director of Health District No. 6 of the Philadelphia Department of Public Health.

Dr. Carl C. Janowsky, director of the division of epidemiology, and Dr. Donald Cornely, chief of the section of maternal and child health, Philadelphia Department of Public Health, assisted in obtaining clearance for this study. Sister Superior Mary Edwards, principal of St. Peter's Elementary School, gave general supervision to the teachers during collection of specimens and administration of the drugs.



Left: Standard fecal smears were prepared, using an exposure meter, for microscopic examination to determine the intensity of the helminth infections. Right: Medication was placed in individual envelopes for each student.

approximately 50 percent Puerto Rican children, was selected for the therapy. At the beginning of the program, in February 1960, the total enrollment of the 8 grades was approximately 400. The number of pupils per class ranged from 25 to 70. Signed permission slips were received from the parents or guardians of 98 percent of the pupils. The remainder of the children were excluded from the program.

Parasitological Examinations

Because of the seriousness of schistosomiasis, an effort to detect infections with *Schistosoma mansoni* was incorporated into this program. Three hundred and ninety children were skin tested with an *S. mansoni* antigen, which is being evaluated by the Communicable Disease Center of the Public Health Service (18) for the World Health Organization. Although the details of the skin test results have no bearing on this study, 60 of the children responded to the skin test antigen, 40 of them Puerto Ricans. These 60 children and 50 others from areas of Puerto Rico in which parasitic infections are endemic were selected for stool examinations.

Prior to therapy 3 stool specimens were requested from the 110 pupils during a 3-week period. For children demonstrated to be infected with one or more species of nematodes (*T. trichiura*, *A. lumbricoides*, hookworm, and *S. stercoralis*) two stool specimens were examined at 1 month and at 2 months after therapy.

The same laboratory regimen was used throughout. Collection cartons were distrib-

uted by the teachers. The desired dates of the specimens and information identifying the pupils were written on the cartons. The specimens were delivered to the parasitosis clinic by the pupils, usually on their way to school (about 8 a.m.). As soon as possible, a portion of each specimen was preserved in a jar containing 10 percent formalin.

Each preserved specimen was examined for eggs by the formalin ether concentration technique (19). Egg counts were made on those specimens revealing intestinal nematodes, using the standard smear technique of Beaver (20). When eggs were not observed in standard smears prepared from specimens which were positive by concentration, the egg counts were recorded as being less than 500 eggs per gram. In appraising the effectiveness of therapy the average number of eggs per gram of feces in the four post-treatment specimens was compared with the average number in the three pretreatment specimens. No attempt was made to quantitate counts of less than 500; however, in determining the average number of eggs "less than 500 eggs per gram" was counted as 250. Although identified protozoa were recorded, no special attention was given to the study of these organisms.

Therapy

The dithiazanine II (D II) was in the form of enteric-coated tablets consisting of a cellulose phthalate coat and a core of dithiazanine iodide and methylcellulose. The ovoid blue



Left: Medication was administered by the teacher in rear of the room while students worked on their class assignments. Right: Liquid medication was given to children who were unable to swallow the capsules or tablets.

tablets were available in 50 and 100 mg. sizes. The dithiazanine amberlite (D amb) consisted of dithiazanine iodide combined with a resin (a copolymer of styrene and divinylbenzene) and was available in 50 and 100 mg. capsules. The placebo consisted of tablets and capsules resembling the dithiazanine formulations but containing wheat flour in the place of the active ingredient.

Since the non-Puerto Rican school children in Philadelphia have been shown by Weiner and co-workers (1) to be rarely infected with nematodes (with the possible exception of *E. vermicularis*), there was little need to give medication to this segment of the school population. However, in order not to appear to discriminate by selecting the Puerto Rican children for therapy, a placebo was given to all the non-Puerto Rican and the uninfected Puerto Rican children. The two dithiazanine formulations were assigned randomly to the unexamined Puerto Rican children and to those known to harbor intestinal nematodes.

The same 10-day course of therapy was used for each dithiazanine product. The total daily dose was adjusted to the weights of the children as follows: 20-29 lb., 200 mg.; 30-39 lb., 300 mg.; 40-49 lb., 400 mg.; 50-59 lb., 500 mg.; 60 lb. and over, 600 mg. The placebo was administered at a similar rate for the 10-day period. The required number of tablets or capsules of the assigned drug for each child was placed in an envelope labeled with the child's name, weight, class, medication code, and dose.

The daily dose for each person was divided and one-half given at 9 a.m. and the other at 1 p.m. The medications were administered on the school days of two consecutive weeks. The 10 days of therapy were therefore interrupted by the 2-day weekend.

The medications were administered in the classrooms by the teachers with the assistance of business school students who recorded on an appropriate chart the number of capsules or tablets swallowed. A Spanish-speaking physician was present during each therapy period in order to handle any problems of administration or reactions. Children who were unable to swallow the assigned tablets or capsules were given the drug or the placebo in a teaspoon of water. Since only about a dozen were given the suspensions, a separate analysis comparing that method of administration with the capsules and tablets could not be made.

The teachers were asked to record by date all side reactions observed or reported to them. In addition, three times each week they specifically asked all the children receiving D II and D amb and the uninfected children receiving the placebo a set of standard questions concerning the occurrence of reactions. An attempt was made to phrase the questions so as not to induce psychosomatic reactions. Specific attention was given to reports of vomiting, nausea, abdominal pain, diarrhea, and blue urine. Reports of blue urine were immediately investigated by the physician, but he found all of them to be erroneous, primarily the result of language difficulties.

The teachers were instructed to refer to the physician unusual side effects, persistent symptoms, refusal to continue medication, or any emergency. If a pupil was absent from school, the cause was determined and recorded. If reactions occurred over the weekend, the students were instructed to call the principal, who would refer the patient to a local hospital where a medical member of the staff was alerted to attend to any situation that would arise; no such cases developed.

Results

Parasites Found

Of the 110 children selected for examination, 107 submitted three stool specimens each during the 3-week period prior to therapy. The remaining three withdrew from the program because they left the school.

Of the 107 children, 87 were Puerto Ricans. Fifty-nine (68 percent) were infected with one or more helminths (table 1). *T. trichiura* and hookworm were the most prevalent. Although no special effort was made to find and identify protozoa, 49 (56 percent) were found to harbor these organisms. Only one infection of *Entamoeba histolytica* was observed.

Table 1. Parasitological results of pretreatment examination of 3 stool specimens each from 87 Puerto Rican children in a school anthelmintic program

Organism	Number of children positive	Percent positive
Helminths	59	68
<i>Trichuris trichiura</i>	52	60
Hookworm	23	26
<i>Ascaris lumbricoides</i>	1	1
<i>Strongyloides stercoralis</i>	3	3
<i>Enterobius vermicularis</i>	2	2
<i>Schistosoma mansoni</i>	5	6
Protozoa	49	56
<i>Entamoeba histolytica</i>	1	1
<i>Entamoeba hartmanni</i>	1	1
<i>Entamoeba coli</i>	24	28
<i>Endolimax nana</i>	23	26
<i>Iodamoeba buetschlii</i>	1	1
<i>Giardia lamblia</i>	18	21
Total, helminths and/or protozoa	74	85

No helminths were found in the 20 non-Puerto Rican children although 7 (35 percent) harbored protozoa (none with *E. histolytica*, 2 with *Entamoeba coli*, 2 with *Endolimax nana*, 2 with *Giardia lamblia*, and 1 with both *E. coli* and *E. nana*).

Side Reactions to Therapy

The following numbers of children received the three medications from March 21 through April 1:

	Number of children
Dithiazanine II	64
Puerto Ricans infected with nematodes	28
Unexamined Puerto Ricans	36
Dithiazanine amberlite	64
Puerto Ricans infected with nematodes	29
Unexamined Puerto Ricans	35
Placebo	262
Examined but no nematodes found (27 Puerto Ricans)	47
Unexamined non-Puerto Ricans	215

During the 10 days of therapy and the intervening weekend, the prevalence of side reactions was approximately the same for children on D II (56 percent) and those on D amb (50 percent), as shown in table 2. Also, there was essentially no difference in prevalence of side reactions during the first 5 days, but from the 6th through the 12th day 44 percent of the children on D II and only 25 percent of those on D amb had reactions. The difference between these percentages is significant at the 5 percent probability level with $X^2=4.19$. More than one-fourth of those on the placebo reported reactions, with the greatest proportion occurring during the first 5 days. From 20 to 30 percent of those reacting to the three medications, reacted on either the first or second days.

Nausea, vomiting, and abdominal pain were the most common reactions to both of the dithiazanine formulations (table 3). Nausea and vomiting were more frequent with D II than with D amb; however, the differences are not statistically significant. For two children on D II, medication was stopped after 9 days of therapy because of persistent vomiting. Twenty-three percent of those receiving the placebo complained of nausea. Of the children having reactions, 46 percent had them only on

1 day and 69 percent experienced only one type of complaint.

Effectiveness of Therapy

Of the 57 infected Puerto Rican children who received the dithiazanine formulations, 53 submitted 4 post-treatment stool specimens.

Forty-five of these 53 children were infected with *T. trichiura*. Seventeen (85 percent) of the 20 treated with D II were apparently "cured" (no eggs demonstrated), as compared with only 11 of the 25 (44 percent) who received D amb (table 4). This difference is significant at the 5 percent probability level with $X^2=6.3$. Also, the percentage reduction in the average egg count was greater in those receiving D II (97 percent versus 75 percent). However, the distribution of percentage reductions by individuals exhibited modes between 90 percent and 100 percent for both drugs. D II appeared to be more consistent in reducing egg counts since

four children on D amb had no reduction. The nature of these distributions was such that a statistical test for significance is not justified.

Twenty of the children submitting four post-treatment specimens were infected with hookworm. Although neither of the two dithiazanine formulations was very successful against hookworm, D II was somewhat more effective than D amb (table 5). Two of the 10 (20 percent) on D II and 1 of the 10 on D amb were apparently cured. Average egg counts were reduced 49 percent for D II and 13 percent for D amb. These differences are not large enough to be statistically significant in a sample of this size.

Two of the 53 children were infected with *S. stercoralis*. This organism was not seen in any of the post-therapy specimens from these two children. One of these children was treated with D II and the other with D amb. The one child infected with *A. lumbricoides* received

Table 2. Prevalence of side reactions in children receiving dithiazanine or placebo in a school anthelmintic program

Therapy	1st-5th day			6th-12th day ¹			Total period		
	Number on drug	Number reacting	Percent reacting	Number on drug	Number reacting	Percent reacting	Number on drug	Number reacting	Percent reacting
Dithiazanine II (tablets) ---	64	23	36	² 61	27	44	64	36	56
Dithiazanine amberlite (capsules) -----	64	25	39	64	16	25	64	32	50
Placebo -----	47	11	23	³ 46	3	7	47	13	28

¹ No therapy on 6th and 7th days.

² 3 dropped from study during 1st week.

³ 1 dropped from study during 1st week.

Table 3. Types of side reactions in children receiving dithiazanine or placebo during 12-day school anthelmintic program

Therapy	Number on drug	Nausea		Vomiting		Abdominal pain		Other reactions		Multiple reactions		Therapy discontinued because of reactions	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Dithiazanine II (tablets) -----	64	30	47	23	36	17	27	2	3	8	13	2	3
Dithiazanine amberlite (capsules) -----	64	26	41	16	25	17	27	4	6	13	20	0	0
Placebo -----	47	11	23	2	4	3	6	3	6	3	6	0	0

D II. Although the infection was not eliminated, the post-therapy examination revealed a 75 percent reduction in the egg count.

Discussion

Each phase of the therapy program was completed on schedule with a minimum of difficulty, thanks to the interest and cooperation of the teachers and the orderly behavior of the pupils. Of the various phases of the program, the 10-day therapy period required the greatest attention on the part of the teachers. However, after the teacher had developed a system for administering the medications, all the students in a class could usually be treated within 15 to 20 minutes. In a number of classes lessons continued during these periods. After the first day, any child known to have difficulty swallowing the assigned medication was sent to a physician in the school's clinic for special handling. This arrangement made it possible for the drug administration in the classrooms to be handled in a routine manner.

Although the prevalence of side reactions was rather high, it should be realized that a special effort was made to record all symptoms conceivably referable to the medications. Reactions were recorded five times more frequently

with D II in the school children than in the outpatients of the parasitosis clinic (16). Whereas 36 percent of the children had reactions during the first 5 days, only 7 percent of the outpatients reported reactions during a 5-day course of therapy. Similarly, children on placebo had six times as many reactions as were reported by the outpatients on placebo. Group psychology probably played a role in the occurrence of complaints in the school children. Although the placebo capsules contained only flour, approximately one-fourth of those receiving them reported the subjective feeling of nausea. Only 2 of the 47 on the placebo actually vomited. Except in two instances when therapy (D II) was discontinued because of vomiting, the occurrence of side reactions did not interfere with the program or constitute a problem. In most instances, a given child experienced only one type of complaint, and approximately one-half of those children with reactions had them only on 1 day.

Regardless of the therapy received, approximately 25 percent of the children with reactions had them only on the first and second days. Possibly these reactions were due to the excitement of the new activity and the inexperience of those giving the medication. In addition, the longer course of therapy (10 rather than 5

Table 4. Effectiveness of dithiazanine against *Trichuris trichiura* in a school anthelmintic program

Therapy	Number infected	Cured ¹		Average egg count		
		Number	Percent	Pretreatment	Post-treatment	Percent reduction
Dithiazanine II (tablets)-----	20	17	85	2, 470	70	97
Dithiazanine amberlite (capsules)-----	25	11	44	3, 670	930	75

¹ No eggs demonstrated in post-therapy specimens.

Table 5. Effectiveness of dithiazanine against hookworms in a school anthelmintic program

Therapy	Number infected	Cured ¹		Average egg count		
		Number	Percent	Pretreatment	Post-treatment	Percent reduction
Dithiazanine II (tablets)-----	10	2	20	1, 260	640	49
Dithiazanine amberlite (capsules)-----	10	1	10	1, 700	1, 480	13

¹ No eggs demonstrated in post-therapy specimens.

days) contributed to the high rate of side reactions. The number of children receiving dithiazanine who reported reactions increased by 42 percent (from 48 children to 68 children) during the second week of medication.

Since it was believed that D amb would release the active ingredient progressively along the length of the small intestine it was anticipated that it would be more effective than D II, particularly against hookworm which is located in the upper parts of the intestinal tract. Although in this study D amb (in capsules) was less toxic than D II, its anthelmintic properties were not as great as D II against *T. trichiura* and hookworm. Possibly the anthelmintic action of both dithiazanine products would have been greater if medication had been given over a longer period of the day. One-third of the daily dose could perhaps have been given to each child to be taken at home, but we considered it preferable to halve the daily dose so that the prescribed amount could be given under supervision at school.

The effectiveness of D II against *T. trichiura* in this study compares favorably with the best results reported by others using the commercial product (3,4,8,9,11,12,14,15,21). In our previous work with outpatients at the parasitosis clinic (16), D II and the commercial product were equally effective, but their effectiveness was less than that reported by other investigators. The greater effectiveness of D II in the school program was probably due to two factors: the assurance that the children received the prescribed medication and the longer course of therapy. Although a 10-day course of therapy has been shown by others to increase the effectiveness of dithiazanine to some degree (4), we believe that the greater effectiveness in this study as compared with the treatment of clinic outpatients is more likely due to the certainty that the medication was received.

The number of hookworm patients treated with D II in the present study is perhaps too small for strict comparison with the findings of others regarding the commercial product (4,7,8,9,11,12,15). The effectiveness of D II observed in our study, however, appears to be comparable to or less than that reported by others with the commercial product. In a comparative study of 17 hookworm patients, Evans

and co-workers (14) reported that D II and the commercial product produced similar results in reducing egg counts (approximately 95 percent reduction).

Spontaneous loss of worms is known to occur in persons who no longer reside in endemic areas. In a survey of elementary school children in Philadelphia (1), it was observed that the prevalence of hookworm was reduced by approximately 50 percent after residence in the city from 4 to 6 years, and to zero after 6 years. The prevalence of *T. trichiura* persisted at a fairly constant level for 6 years but afterward decreased by approximately 50 percent. Complete information on length of residence in the United States was not available on all the school children in the present study. However, two of the children who had not visited Puerto Rico for 7 years still harbored hookworm infections.

Since worms often disappear without therapy, it would have been desirable in evaluating the anthelmintic effects of the drugs to have had groups of infected children on the placebo. However, this was not practical in this program since it was considered desirable to treat all children known to be infected. In the treatment of outpatients at the parasitosis clinic (16), placebos were given to persons infected with *T. trichiura*. Over a 4-month post-treatment period 10 percent were "cured," and a 34 percent reduction was noted in the egg counts. D II, on the other hand, apparently eradicated the infection in five times as many of the outpatients and resulted in more than twice the reduction in worm burden. Although these comparisons between the placebo and the dithiazanine products in outpatients might be considered in determining the "true" effectiveness of the therapy used in the school program, they would not influence the conclusions regarding the relative effectiveness of the two formulations.

Although successful mass therapy without significant side reactions has been reported with the commercial tablets of dithiazanine (11,15), Ding and Sutlive (13) concluded from their study in Sarawak, Borneo, that "because of its lack of activity against hookworm and the large number of patients with reactions of nausea or vomiting, or both, dithiazanine ap-

pears to be unsuitable for mass therapy treatment of patients in this area." From the results of the present study and of previous work (14,16,17), D II appears to be a better formulation of dithiazanine for use in mass therapy. It is much less toxic than the commercial product and to date appears to be as effective against *T. trichiura*, *A. lumbricoides*, and *E. vermicularis*. Effectiveness against hookworm has not been convincingly demonstrated, and with exception of the one case in this study no reports have appeared on the treatment of *S. stercoralis* infections with D II. However, in view of the increase in side reactions which developed during the second week of therapy in the present study, administration of D II should perhaps be restricted to the standard 5-day course (14,17). D amberlite as used in this study does not appear to constitute an improvement. Its lower toxicity and reduced effectiveness may indicate that the active ingredient is not being completely released in the intestines.

It is questionable whether mass therapy is necessary against nematode infections harbored by Puerto Rican children in this country. Information gathered to date indicates that most infections are light and many will be lost spontaneously. Although symptomatology referable to helminth infections is frequently related to the nutritional status of the host, it is generally agreed that 100–200 adult hookworms (2,600–5,000 eggs per gram) and 200 adult *T. trichiura* (25,000–30,000 eggs per gram) are necessary to produce symptoms in the host (22,23). Only 8 percent of the school children in this study infected with *Trichuris* and 25 percent infected with hookworm had parasite counts at these significant levels on at least one of their three pretreatment examinations. On this basis it can be estimated that approximately 11 percent of the Puerto Rican children in the school had clinically significant infections of nematodes. The status of pinworm infections in the school was not determined by the procedures employed. In an endemic area one of the objectives of mass therapy is to eradicate the infections and thus help to interrupt transmission. In the northern United States, the objective of anthelmintic therapy can possibly be limited to reducing the intensity of

helminth infections to insignificance for the benefit of the individual.

If an inexpensive, highly effective, nontoxic drug that could be easily administered at school were available, it might well be argued that mass therapy would be appropriate, even though only 8 percent of the Puerto Rican children have clinically significant nematode infections. Unfortunately, such an ideal drug has not yet been developed. Therefore, although the examination of stool specimens is expensive and laborious, it might be better to seek out and treat the heavy infections rather than bear the expense of administering an anthelmintic to many children who may not particularly profit from the medication. The teachers in this country should be made aware of the possibility that parasitic infections may be responsible in some instances for the ill health and slower development of Puerto Rican children in their classes. They should be encouraged and given necessary assistance to have these children properly examined for parasites.

Summary

Pretreatment stool examinations indicated that 68 percent of the Puerto Rican children in a Philadelphia elementary school harbored helminths, principally *Trichuris trichiura*.

A 10-day therapy program was instituted using two formulations of the broad-spectrum anthelmintic, dithiazanine, to treat 128 infected or unexamined Puerto Rican children. A placebo was given to 262 uninfected Puerto Ricans and uninfected or unexamined non-Puerto Rican children.

In determining relative effectiveness of the two formulations, results of three pretreatment and four post-treatment stool examinations were analyzed for 45 children infected with *T. trichiura* and 20 infected with hookworm. Dithiazanine II (tablets) was significantly more effective than dithiazanine amberlite (capsules) against *T. trichiura* (85 percent versus 44 percent cured; 97 percent versus 75 percent, reduction in egg counts). Although dithiazanine II also appeared to be more effective against hookworm, the differences were not statistically significant.

During the first 5 days of therapy, 36 percent

of the children on dithiazanine II, 39 percent on dithiazanine amberlite and 23 percent on the placebo had side reactions. The relative intolerance to dithiazanine II increased during the second 5 days of therapy. With the exception of excessive vomiting by two children who were removed from therapy with dithiazanine II on the 9th day, the side effects did not constitute a serious problem.

Dithiazanine II has promise as a suitable drug for mass therapy against nematode infections, since it appears to be more effective and better tolerated than the commercial dithiazanine product. However, since most children have light infections and many lose the worms spontaneously, over a period of years, it is questionable whether mass therapy against nematode infections harbored by Puerto Rican children is necessary in schools located in the northern United States, which is outside the recognized endemic areas for these parasites.

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SUPPLY REFERENCE

- (A) Eli Lilly and Co., Indianapolis 6, Ind.

Program Notes

Severe aspirin poisoning in seven children was successfully counteracted by intermittent lavage of the peritoneal cavity with a 5 percent albumin solution in clinical trials reported by Dr. J. N. Etteldorf and co-authors in the *Journal of Pediatrics*. A Public Health Service grant supported the studies.

« »

How private physicians can help halt the rise in venereal disease, particularly in obtaining and reporting information about contacts, is discussed by Dr. L. L. Heimoff of New York Hospital's syphilis clinic in *Medical World News* (June 9, 1961).

« »

An extensive, year-long study of air pollution in Philadelphia has been undertaken by the city health department and the Public Health Service. Nine air sampling machines will be used to record amounts of pollutants in various parts of the city, 24 hours a day.

Previously gathered data show a 30 percent decline in air pollution in Philadelphia on weekends compared with weekdays. The ratio of lead to total dirt in samples obtained from the new sampling stations may enable investigators to determine the extent to which reduced city traffic is responsible for the weekend decline.

Los Angeles and Cincinnati are conducting similar studies.

« »

The 1961 "Bibliography of Medical Reviews," prepared by the National Library of Medicine, will be a cumulative issue, containing all material published in BMR since the beginning of the series in 1955, in addition to new material for 1960. Copies will be available in late 1961.

« »

The 30th anniversary report of the Cortland County, N.Y., health department includes an extensive review of the history of public health services in the county.

A short-term intensive training program for accident prevention specialists is being developed at New York University under a contract with the Division of Accident Prevention, Public Health Service.

« »

Twenty-four cases of rabies in foxes, cattle, cats, skunks, and raccoons but none in dogs were reported in the first quarter of 1961 for New York State, exclusive of New York City.

« »

About 28,000 engineers, 12,500 scientists, and 47,000 technicians were employed by State governments as of January 1959, according to a National Science Foundation report. These were more than 10 percent of the total personnel in State agencies.

« »

Brown University officials are planning a 6-year curriculum in the medical sciences. Graduates of the program will be prepared to go into a medical school as third-year students, or into teaching or research in the medical sciences by completing 2 additional years of study for a Ph.D. degree.

« »

Transcripts of a recent discussion by physicians and scientists on "The Aging Patient" are available from the Information Officer, Center for Aging Research, National Institutes of Health, Bethesda 14, Md.

« »

Since 1958, the venereal disease educational assistance program of Ohio's Departments of Health and Education has provided more than 1,000 teachers with training in incorporating venereal disease education into school curriculums. The program is supported by a grant from the Public Health Service. More than 60,000 copies of a pamphlet on venereal disease, "Strictly for Teenagers," have been distributed.

The Highway Research Board is sponsoring a study to appraise the registration and titling system in the States and thus permit improvement in the control of vehicles and drivers, according to *Automotive Safety*, a quarterly publication of the Automobile Manufacturers Association, Detroit.

Registration and titling aid in identifying vehicles and their owners in the event of an accident or law violation and are instrumental in the collection of privilege taxes for street and highway use.

Many States use part of the fees collected to finance traffic safety improvement measures.

« »

Dr. Ludwik Gross of the Bronx, N.Y., Veterans Administration Hospital and Sloan-Kettering Institute, states in his new book, "Oncogenic Viruses," that it is now apparent that most malignant tumors of chickens and of mice are caused by viruses. It is possible, perhaps probable, that malignant tumors in humans also are caused by viruses, he says.

« »

One of every two alcoholics has had an alcoholic parent, says Dr. Marvin A. Block, chairman of the American Medical Association's committee on alcoholism. He states that alcoholism is a "communicable" disease and is not hereditary.

« »

An antirabies program to reduce the fox population has been planned by the New York State Conservation Department. An estrogen hormone in chunks of meat, placed along wild fox runs, will reduce mating among foxes and eliminate new potential rabies carriers.

« »

The Allegheny County Board of Health, Pittsburgh, Pa., has received a recommendation from Herbert R. Domke, director, and Herbert J. Dunsmore, chief of the bureau of air pollution, Allegheny County Health Department, to provide a definite schedule for the installation of dust collection equipment to control major sources of air pollution from the steel industry.

Primary Needs in Occupational Health

ALBERT E. HEUSTIS, M.D., M.P.H.

CLARE BOOTHE LUCE, while serving as Ambassador to Italy, was troubled by a lingering illness. She returned to New York for extensive medical examinations, which showed anemia and extreme fatigue. When she went back to Rome, the old symptoms reappeared along with some new ones—brittle fingernails, loss of hair, and loosening of teeth. She spent more and more time confined to bed. She had also noticed for a long time that the coffee she drank in her bedroom had a metallic taste, but had decided that Italians simply couldn't make American coffee.

Mrs. Luce had been living in the spacious 17th century Villa Taverna and the heavy beams of her bedroom were decorated in terra cotta with roses and rosettes. Many coats of paint had been brushed on the roses to make them stand out against the background, and as people walked about on the floor above, bits of dust fell from the ceiling. The diagnosis: Mrs. Luce had been breathing, eating, and drinking arsenic from the paint.

This story was of special interest to the Michigan Department of Health because one of our early achievements was a study of arsenical wallpapers dramatically titled "Shadows From the Walls of Death." The study, done in 1874 by Robert C. Kedzie, states:

"Perhaps we could not devise a more effectual way to contaminate the air of our homes with a small amount of arsenical dust, than by the use of wallpaper colored with arsenical preparations. . . . That the air of every inhabited room is filled with finely divided particles of matter is clearly seen when a ray of sunshine is admitted into a darkened

room. That this dust contains arsenic when the walls are covered with arsenical paper has been demonstrated by analysis of the dust which had settled on the furniture. . . . Dyspepsia, neuralgia, pains in the bones and joints simulating chronic rheumatism, headache, general debility, etc., are symptoms which often attend this form of chronic arsenical poisoning. . . . Retail dealers, for the most part, are innocent in this matter, for most of them are ignorant of the composition of the coloring matter, and are not aware of the danger of its use. . . . But the manufacturers cannot enter a plea of ignorance, for they know the materials employed and the danger of their use. . . . A paper printer cannot work more than two or three weeks at a time with arsenical pigments; he must then change his work to enable him to sufficiently recover his health to again begin printing in arsenical colors."

This early work is a reminder that occupational diseases have been with us for a long time, and while many current problems may be more subtle than those of earlier days, we seldom, if ever, are completely rid of even the oldest hazards. The same basic problem, shared by midwest farm families of the late 19th century and a U.S. Ambassador of the mid-20th century, indicates the exceedingly important place of occupational health in the whole field of public health. The Kedzie study was instrumental in the development of the Michigan Health Department nearly 90 years ago. With the growth of population, industry, and technology, occupational health can only increase in importance.

In determining the needs in occupational health today, there are five specific approaches to consider as discussed in the following pages.

Vigorous Effort

First, there is real need to attack occupational disease problems vigorously and in every State. In Michigan, the State occupational health staff

Dr. Heustis is State health commissioner of Michigan. This article is based on a paper presented before the American Conference of Governmental Hygienists held at Detroit on April 10, 1961.

now numbers 28, working from 8 district offices. In the last 10 years both the number of plants served and the number of workers served have increased by one-fourth. Requests from industries have increased 60 percent. During the past 10 years our annual ventilation conference has brought together nearly 2,000 people. We now provide more than 4,500 industrial health consultations every year. Our occupational health and education staffs have combined their talents to produce a quarterly bulletin, *Michigan's Occupational Health*, which has a circulation of about 4,000. And we have engaged in activities in the newer fields of air pollution and radiation.

Despite this progress, we still see much unfinished business and many new problems brought on by this age of plastics and pushbuttons. The image of public health has not kept pace. There are still many who equate public health with communicable diseases and dead horses in the river and little else. Those who are truly interested in modern public health must seek to demonstrate the importance of occupational health, to project it to those in responsible positions. It is our job, collectively, to present the commonplace in occupational health in a way that will be exciting, create understanding, and stimulate support.

Wise Use of Law

As a State health commissioner, I favor realistic and constructive use of regulatory powers in occupational health in conjunction with the educational process. Basically, the educational approach is fine, praiseworthy, and constructive. It has its place and should be used. But there are instances when we must stop saying, "Please," and must use our authority to gain compliance or shut down the operation.

Let us take a hypothetical example. We may visit a foundry where two or three thousand people are employed and see practices which we believe will lead to silicosis in some workers in 10 or 20 years, but the evidence is not the kind that would stand up well in court. Confronted by this situation, we must decide whether we will make the greater gain for public health by trying to close the plant or by continuing to work with management to overcome the prob-

lems. If we fail in an attempt to close a plant, the program receives a serious setback. In this case, then, we would probably decide to work along with management, even with some potential risk to the workers, to achieve longrun adoption of the program.

In another situation, relying only on the longrun program would be less than responsible. Among employees of an operation melting down old lead batteries a few years ago, two men were hospitalized with proved lead poisoning, and blood levels of lead in others were high. This was not the place or time for moving warily. The day we received the evidence the plant was closed and its operators were told to clean up. We worked with the plant managers over a weekend and a holiday, and now one of the finest letters in our files is from this plant.

Constructive use of regulatory powers means we must be as quick to approve and commend as we are to disapprove and criticize. We must be willing to tell industry under what conditions an operation will be approved and then show how these conditions can be met. We must also weigh the economic hardships along with other social consequences, and having weighed these, we must do today what will be best for public health 10 years from today. In the Michigan program, we have seen the educational approach, coupled with firm and correct use of the law, save time, money, and harassment, give our staff needed support, earn the respect of industry and labor, and make the difference between health protection and lack of it for many working people. In this way we make realistic and constructive use of regulatory powers in occupational health in conjunction with the educational process.

Continuous Consultation

Third, we seek to work with industry, not only at management's request, but also on a routine basis. We must visit plants frequently enough to know the processes and to look for those things which we, and not industry necessarily, are trained to recognize as potentially harmful.

Only by visiting factories regularly are we going to keep our fingers on older problems such as lead poisoning, mercury poisoning, sili-

cosis, and others, which continually appear in both old and new settings. In 1959, nearly 150 Michigan workers were receiving compensation for silicosis. With the average cost per worker of about \$10,000, these 150 cases represent approximately \$1,500,000, in addition to the loss of health. We couldn't expect to do much about this from behind a desk in a central office.

Only by visiting factories regularly, furthermore, are we able to discover new hazards before serious harm is done. On a routine call made last year to a plant making bowling pins, we found a hazard from fumes and the potential for a serious explosion. The fumes resulted from a process in which the pins were coated with a resilient plastic material by several dips in a toluene-base solution of the plastic. The plastic was applied so that the pins can take the drubbing they get from automatic pinsetting machines, which bounce the pins together. At first management was cool to recommendations, but when they understood that if they wanted to continue to operate they would have to take necessary protective measures, the needed work was done. The plant management now appreciates and respects our decisions and realizes that serious danger was averted. This is preventive medicine, a product of visiting industry regularly.

Full Use of Competencies

We must also break some traditional boundary lines of occupational health in order to use our training, knowledge, and skills most effectively and the taxpayer's dollars most economically. In 1960, Thurm heaters were responsible for more than a dozen carbon monoxide deaths, but if health officials had not checked some 2,000 of these units all over the country, the death toll could have been in the hundreds. In Michigan, we learned of this hazard when an alert staff member of our division of occupational health heard on his radio that three women had been found dead in a trailer, with the cause of death listed as lack of oxygen. We could have ignored the incident as being beyond the realm of occupational health. Instead, we tested blood specimens of the victims and found carbon monoxide. We tested the trailer and its heater and found a mobile gas chamber. We

then worked with the trailer and heater manufacturers, the fire marshal, the Public Health Service, and all others concerned to protect the public from this potential danger.

When we have the knowledge, equipment, and trained personnel to deal with a problem, it is our job to use these resources wherever and however they are needed, whether to deal with explosive hazards, air pollution, or household poisons such as carbon tetrachloride. We must use the special knowledge of occupational health beyond as well as within the traditional industrial setting.

Field Research

Field research to complement basic laboratory research is a fifth need in occupational health. This includes continued engineering research, such as investigations of airflow and ventilation, and epidemiologic studies. A recent study in Michigan showed that pink rot infection in celery is responsible for celery dermatitis among fieldworkers. In response to a dermatologist's inquiry, we checked with celery growers and found that about 6 out of 10 workers had itching, sore, and often blistered skin, usually on their hands and arms. Then, with the cooperation of the Public Health Service, we ran patch tests and studied extracts from celery plants, and we learned that the dermatitis is associated with pink rot, a fungus disease in celery. Another type of needed field research is the survey, often the only way to determine the hazard potential of a new product or a new process. For example, our staff has recently studied a number of establishments using gas-fired radiant-heat panels. Despite claims made by manufacturers and others, our investigators have found gas and fumes that are not exhausted to the outside and persistent, low-level concentrations of carbon monoxide.

Summary

There are five primary needs in a modern occupational health program:

1. Vigorous development of services in cooperation with doctors and employees, unions, and management.
2. Realistic and constructive use of both regulatory powers and educational techniques.
3. Regular visits to industrial establishments.

4. Application of knowledge gained in occupational health wherever it is required, in or out of industry.

5. Field research: engineering studies, epidemiologic investigations, and surveys.

Health Exhibit in Rome

Approximately 200,000 persons viewed the demonstrations, exhibits, and film showings in the U.S. presentation at the International Health Exhibition, sponsored by the Italian Government in Rome, November 10, 1960, to January 8, 1961.

Exhibits on hospital facilities and care, heart disease research, cancer control and research, air and water pollution, fluoridation, and virus research illustrated and documented the theme "Science for Life and Health." Lay and technical health and medical films were shown continuously in the pavilion theater.

Twenty-five thousand copies of the four-color "prestige" brochure, entitled "Science for Life and Health," and describing the progress of the health sciences in the United States, and 300,000 two-color leaflets were distributed. The material, printed in Italy for the United States, was available in English and Italian.

Contributing to the popularity of the U.S. presentation was the staffing of the exhibits and demonstrations with medical personnel and bilingual guides and demonstrators who could discuss the exhibits and answer questions. Most of the guides were students recruited from medical and dental schools.

The continuous showing of medical films, produced by American health and medical agencies, drew large audiences.

Among the guests attending the exhibition were the President of Italy and members of

Of these, I would emphasize most the need to visit industry regularly, because to keep pace with technological change and to make full use of competencies, we must go to industry, and not wait for industry to come to us.



his cabinet, including the Minister of Health and his staff, and foreign dignitaries. The Minister of Health made a television broadcast from the U.S. pavilion announcing the formal opening of the exhibition.

The U.S. exhibit, one of nine foreign health presentations, was housed in a specially constructed pavilion on the first floor of the West Palace of the Esposizione Universale di Roma. Harry Wiener, Bureau of Medical Services, Public Health Service, served as art director, and John C. Eason, Division of International Health, Public Health Service, as coordinator of the U.S. presentation.

Public Health and the Aging Population

NATHAN W. SHOCK, Ph.D.

A FEW FACTS from the report of the 1961 White House Conference on Aging (1) emphasize the magnitude of the aging problem in the United States:

We have 16 million people over age 65 today.

There will be 32 million over 65 in the next 40 years.

This aged population is expected to represent 1 out of every 10 persons.

While the health of many of these older people will be good, there will also be many whose health will be so impaired that they will require various services. The older we get, the more liable we are to health impairment and the more we need hospital, medical, nursing, restorative, and other services. For example, people over 65 spend $2\frac{1}{2}$ times as many days in hospitals as those under 65. They account for about 18 percent of the admissions to general hospitals and comprise almost one-third of the hospitalized population (2).

In a sense, the problems of our older people, particularly their health problems, have come about because we have for many years focused our principal endeavors on children and people in the earlier years of life. The result is that the children and young adults whose lives have been saved now swell the middle-age and old-age population.

In 1900 the average life expectancy at birth was only about 46 years for white males and about 48 years for white females in the United States. In 1961 the life expectancy for males is

about 67 years and for females it is almost 73 years (3). Most of this difference is due to the marked reduction in infant mortality and mortality from the diseases of childhood and early adulthood brought about by research discoveries and effective health programs.

Improved methods of treatment have had some effect on mortality at the upper ages as well. In 1850, the person who had survived the hazards of infancy and escaped the infectious diseases of childhood and the fatal diseases of middle age so that he attained the age of 60 had a 50-50 chance of living an additional 16 years. Today the 60-year-old has an expectancy of 20 years of additional life.

When new medical discoveries are widely applied, significant changes in death rates occur. Thus, before the discovery of insulin in 1922, the average life expectancy of the 30-year-old diabetic was only 4-6 years. With the introduction of procedures for early detection of diabetes and the use of insulin therapy, the life expectancy of the 30-year-old diabetic has increased to 35 years, or to a total life expectancy of 65 years. During the early part of this century, pneumonia was often a fatal disease among the elderly with death rates ranging from 700 to 1,000 per 100,000 population over age 60. The introduction of sulfa drugs and antibiotics has reduced mortality rates from pneumonia and influenza to less than 10 per 100,000 population over age 60. Medical advances in the prevention and care of cardiovascular disease and cancer may produce even further increments in the population over age 60 in the future (3).

But we are only now beginning to cope with the problems of old people through a vigorous attack not only in research but also in community services.

Dr. Shock is chief, Gerontology Branch, National Heart Institute, Public Health Service, Baltimore City Hospitals, Baltimore, Md. This paper is based on an address to the 32d Annual Convention of the Georgia Public Health Association, Savannah, Ga., May 23, 1961.

Search for Basic Knowledge

As early as 1941, the National Institutes of Health of the Public Health Service recognized that aging and the chronic diseases would become of increasing importance in public health. To provide basic knowledge about aging, the Section on Gerontology was established in collaboration with the Baltimore City Hospitals. It is now the Gerontology Branch of the National Heart Institute.

The primary goal of the Gerontology Branch has been to describe age changes in individuals who have been carefully screened to exclude those with diagnosable diseases in order to set baselines against which the effects of disease and therapeutic regimens can be measured. Since aging is a process which takes place throughout the entire adult lifespan, all tests have been applied to individuals between the ages of 20 and 95 years. These tests are designed to measure the functional capacities of a wide range of physiological systems, such as cardiovascular, pulmonary, neuromuscular, and renal, as well as overall responses, such as recovery from standardized exercise and metabolic responses to specific stimuli.

In studies completed so far tests have been made on different individuals at each decade, that is, by the cross sectional method. To define age changes accurately, repeated observations must be made on the same individual as he ages. Such a longitudinal study is now in progress at the Gerontology Branch using more than 400 men aged 20-100 years who are leading active lives in the community. Each subject volunteers 2 days for testing procedures at the Baltimore City Hospital every 18 months.

From the cross sectional studies we can make a number of generalizations that have significance for health maintenance (4). Perhaps our most striking finding is that many of the beliefs about older people are not true. Not all physiological characteristics show decrements with age. When the body is at rest, characteristics of the blood, which determine the environment in which the cells of the body exist, are closely regulated even into advanced ages. Thus, resting blood volume (5), acidity of the blood (6), its osmotic pressure, and its sugar content (7) are not systematically altered by

advancing age. However, when extra demands are placed on the individual, either by environmental factors or by experimental conditions, older individuals require more time to reestablish equilibrium than do the young. Although the resting level of blood sugar is the same in old and young, the old are slower in removing excess sugar from the blood than are the young (8). After standardized exercise, the old require more time for recovery with respect to pulse rate, breathing, or rate of oxygen uptake than do the young (9). Normal elderly people are able to make the adjustments to stress and displacing stimuli, but they require more time than do the young. From these and many similar experiments, we conclude that aging is associated with a gradual reduction in reserve capacities.

Where decrements in the performance of individuals or of specific organ systems occur, the changes are gradual throughout the lifespan. Thus the resting cardiac output falls by 50 percent between the ages of 20 and 95 years (10). In other characteristics, such as the speed of conduction of nerve impulse, the fall is only 15 percent over the same age span (11). Examination of a wide variety of functional tests shows that aging takes place at different rates among different organ systems. The greatest decrements occur in functions that require coordination and integration among a number of different organ systems such as physical exercise. Thus aging is also accompanied by a breakdown of integrative mechanisms (12).

Research has also shown us the wide individual differences in the effects of age on any performance. For example, we have found that some individuals at the age of 90 have kidney functions as good as the average values for 40-year-olds (13). We must therefore recognize that chronological age in itself is a poor index of capacity and that each individual requires special study and assessment to determine both his strengths and limitations.

Since one of the primary characteristics of aging is the gradual loss of reserve capacities, it is essential that we find out how this comes about. Both histological and physiological studies show that a part of this loss is due to the gradual dropping out of functioning cells and units from key tissues, where replacement no

longer occurs in the adult (14). For example, the reduction in kidney function with age is due in part to the loss of nephrons from the kidney (13). The gradual reduction in basal metabolism with age is due to a reduction in the total amount of functioning tissue (15). Maintenance of functioning in advanced ages will therefore depend on developing methods for preventing tissue losses, and these measures must be introduced early in life.

Although loss of functioning cells plays an important role in aging, changes in intracellular enzymes also occur. The activity of some enzymes associated with energy transformations in cells shows small but significant decrements with increasing age (16,17). Whether or not these changes are reversible is not yet known.

Advancing age is accompanied by psychological as well as biological changes (18-21). In addition to an increasing incidence of sensory impairments, older people undergo a slowing of responses. Reaction time lengthens, and performance diminishes in tests in which time is a factor. There is little evidence, however, that intellectual capacity diminishes until advanced old age is reached. Activities tend to be more sedentary, and memory for recent events is less effective in the old than in the young. Older people retain their capacity to learn, but they may require more time and motivation becomes increasingly important. Skills used continuously throughout life show very little impairment with increasing age, a fact which leads to the presumption that disuse may play a primary role in the impairment of some performances with advancing age.

Socioeconomic Characteristics

Adult behavior is also influenced by the demands and norms set by our culture. The young adult is expected to engage in activities that result in the establishment of an independent family unit of his own, whereas similar behavior in the elderly is regarded as inappropriate. One of the primary problems of the aged lies in the fact that our society has not yet clearly defined the role of the elderly. Public health officers should assume leadership in establishing the aged as active participants in the whole life of the community.

During the past 10 years, other investigators have added greatly to our knowledge about older people as a group. We know that they are likely to live in older, less adequate houses and that they have lower incomes than the rest of the population (22). Less than one-third of males over age 65 are employed, but the income of the employed group is substantially greater than that of the retired group (23). It is also the employed elderly who participate in health insurance plans. Their need for medical and hospital care is substantially greater than that of the rest of the population. Almost 50 percent of those over age 65 receive incomes from the Federal old age and survivors insurance program. In March 1959, the average monthly payment was \$72 and about one-half of all married couples were receiving less than \$125 per month (24). Comparing these incomes with the Bureau of Labor Statistics estimate that a retired couple needs \$1,900 per year to maintain an adequate level of living, it is clear that most retired couples dependent on Federal old age and survivors insurance payments must exist on marginal incomes.

Sociologists have characterized the aged as a quasi-minority group in our present culture, because they are excluded from participating fully in our society and are dominated by other groups who set the norms or standards of behavior for them (24). Older workers are often the last to be hired and the first to be fired. Compulsory retirement excludes individuals from employment after a certain age without consideration for the capabilities of the individual. Clearly, many of the problems confronting older people are manmade.

Health Department Action

The 1961 White House Conference on Aging outlined in detail many of these problems, and, in its recommendations, offered a blueprint for action. Public health has a key role in this effort, and local public health officers represent the primary source of action.

In meeting the challenge of the aging of our population I believe a major task of the health department is education. It is up to the health department to see that knowledge gained through research is translated into action.

Much that has been learned about treatment and rehabilitation among the aged is not yet being applied. An aggressive, optimistic approach in which all the knowledge and methods now available are put to use must replace attitudes of fatalism toward diseases of the elderly.

The health department can also help to educate the aging individual himself not only to accept certain limitations which age may bring but also to recognize the individuality of aging and the fact that many activities may be preserved. In this connection, programs for health maintenance can make a major contribution.

In addition, much can be done in educating the community to use the many talents remaining to the elderly. With a minimum of training, many aged people could make friendly visits to less capable elderly persons and also could perform homemaking services for such persons. Instead of being excluded from the mainstream of community activities, older people should be included to the fullest extent of their capabilities.

In collaboration with private agencies, the health department should also work toward the coordination of services for older people. Coordinated medical care which permits easy movement of patients from the home to the hospital, to the nursing home, and back to the home must be developed. Home care and such ancillary services as visiting nurses, home maker services, "meals on wheels," and activity centers for the aged also need to be developed and coordinated.

As in the past community health services have been expanded and adapted to meet whatever challenges arose, so today they must be geared to help meet the needs of our mushrooming population of old people.

Research has not yet discovered ways of preventing many of the diseases that afflict elderly people. However, we do know that it is often unnecessary to use precious hospital beds for long-term convalescence. We also know that rehabilitation methods can increase the capacities for self-care in many elderly patients who in the past have been abandoned to a life of expensive custodial care. Rehabilitation means more than restoring capability for employment; it also means preparing individuals for self-

care. With increasing age, the probability of illness, with hospitalization, increases. It is high time we consider plans whereby individuals may begin early in life to insure themselves against catastrophic medical needs later on.

The current heart program in Georgia is an excellent example of how public and private agencies can work with the physicians and the individual. Georgia's first heart clinic, some 10 or 12 years ago, was, I understand, a cooperative enterprise of the heart association, the health department, Emory University, and private physicians. Not only has the program of services to people grown through this cooperative approach, but postgraduate education for physicians and paramedical personnel has been built into the program. In conjunction with this established cooperative structure, a program of rehabilitative and other services to stroke victims has been developed.

Hope for Future Progress

The best hope of the greatest future progress in solving the problems of the aged lies in gerontological research in biological, medical, social, psychological, and other fields. This research cannot be done solely in the laboratory with the test tube or experimental animal. Gerontological research must also have the community and the population for its laboratory. Studies of cells are, of course, extremely valuable for a better understanding of the aging process, but studies of people, among people and in the places where they live, will perhaps be equally as important, or even more important. Solutions to the problems public health faces in its efforts to help the aging will come, in a great many instances, from studies in which the laboratory is, in effect, the community. Research is not an island; it is part of the main continent of human activity, and it is dependent upon working with people to achieve its goals.

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Housing for the Elderly

The Federal Housing and Home Finance Agency has a new Office of Housing for the Elderly which will coordinate the agency's various programs for housing older persons. The programs include the many mortgage insurance plans of the Federal Housing Administration, the Federal National Mortgage Association program for purchasing FHA-insured mortgages covering multifamily units for older persons, the direct Federal loan plans authorized by the Housing Acts of 1959 and 1961, and public housing projects.

The central office will work out standard policies and rules with the constituent agencies, provide information and counseling services concerning the various programs, conduct research, and assist in training personnel. The central office itself will not administer any of the program operations.

Translated Readings

The following items have been culled from the CIA *Scientific Information Reports*, distributed by the Office of Technical Services, U.S. Department of Commerce. Numbers following each item refer to the issue and item, in that order. All issues are from the PB 131891 T series.

Sundew Antibiotic

Plumbagin, an antibiotic, 2-methyl-5-oxy-naphthoquinone-1,4, is the factor in a round-leaf grass called sundew, according to B. P. Koslov (55, 114). It was found effective against pertussis and tuberculosis. The bibliography has 25 titles.

Fatigue Measurement

Methods of measuring occupational fatigue are discussed by Prof. S. A. Kosilov, in *Vestnik Akademii meditsinskikh nauk S.S.S.R.* (55, 139).

Mental Health

Current and prospective improvements in psychiatric services in the U.S.S.R. are described by Z. N. Serebryakova in the *Zhurnal nevropatologii i psikiatrii imeni S.S. Korsakov* (55, 146).

Manpower

The training of physicians in sanitary specialties in the Soviet Union uses facilities of a special institute in Leningrad and teachers of "sanitary hygiene" at 22 other medical institutes. More than 14,000 students are enrolled in these sanitary courses.

With 25,300 physicians employed in epidemic control by the U.S.S.R. Ministry of Health, annual admission of 1,600 new students of hygiene is expected to swell the total number of sanitary physicians to 36,000 in 1965.

The interest in training in preventive medicine was accented by a decree of the Central Committee of the Communist Party of the Soviet Union and the Council of Ministers, U.S.S.R., January 14, 1960. The program out-

lined in an unsigned article in *Sovetskoye zdoravookhraneniye* indicates that "sanitary-epidemiological stations must become fundamental components of sanitary hygiene faculties . . . strengthening the bond between education and life through the extensive participation of students in socially useful work" (56, 129).

Brucellosis Vaccine

A report on vaccination of 2,750 persons vaccinated cutaneously with a preparation from *Brucella abortus* strain 19-BA is published in the *Zhurnal mikrobiologii, epidemiologii, i immunobiologii* by I. F. Taran (57, 105).

Noise Effects

Physiological effects of noise of low frequency and high intensity were observed in a population of young workers by A. A. Arkad' yevskiy. His results, reported in *Gigiyena i sanitariya*, indicate a considerable disturbance of functions by intensities of 100 decibels with extended delay of recovery (57, 127).

Radiation

A collection of reports on the chemical protection of organisms from ionizing radiations, edited by V. A. Balabukha, was published in 1960 in Moscow (57, 135). The second part deals with elimination of radioactive elements from the body.

Noise Measurement

The quality of devices and methods used in measuring noise in the Soviet Union, the United States, and in Western Europe is reviewed by I. A. Gradskiy in *Gigiyena i sanitariya* (58, 116a).

Foot-and-Mouth Disease

High immunogenic properties, with a duration of 2-5 months for a foot-and-mouth disease vaccine made from rabbit-adapted virus are reported by S. R. Didovets, chief, veterinary administration, Kiev. The recommended method is a dose of 1 ml. of the vaccine in the tunica submucosa of the upper jaw (50, 107).

Dental Officer Career Development

NORMAN F. GERRIE, D.D.S., M.P.H.

ALMOST certainly, even the most dedicated public servant employed in a large organization asks himself from time to time these questions: Am I progressing satisfactorily in my work? Am I developing professionally? Am I considered for new and challenging opportunities when they arise within my organization? What assurance do I have that my professional interests and aptitudes are recognized and considered when I am transferred to a new assignment?

On the other hand, administrators with responsibility for the successful attainment of the objectives of a public agency are likely to ask themselves these corresponding questions: Is this employee capable of handling this new assignment? How can I be assured that he is the best candidate for this position? How can I meet and overcome the attractions offered by employment in some other organization? How can I meet the future needs of my program for trained and competent personnel?

These significant questions are commonly raised by two kinds of people: those who do the work, and those responsible for getting them to do the work. The questions are concerned essentially with personnel retention, assignment, and development. Experience within the Public Health Service in dealing with these problems has led to the formulation of a systematic procedure designed to overcome some of the major difficulties associated with the

optimal use of dental officers. This procedure is called career development and is applied to the 350 active duty dental officers employed in the various dental activities of the Public Health Service. The career development program as discussed in this review does not cover civil service personnel employed in the several dental activities of the Service, and detailed consideration is given here only to career development as it pertains to the dental public health activity of the Service.

Although the program in its present outlines has been in existence for only 2 years, its activities have been evolving gradually during a much longer period and are still undergoing change as circumstances dictate. In this regard, two important circumstances influencing the character of the program should be kept in mind. First, the Public Health Service does not have at this time an official, comprehensive Service-wide career development program for officers of all professional categories; each category (or program) has developed its own method. Second, although all the dental activities of the Service participate in the conduct of the career development program for dental officers from the standpoint of general procedure and coordination, each individual dental activity follows its own plan for training.

PHS Dental Officers

Before discussing the career development program itself, I should like to give focus to later remarks by mentioning some characteristics of the dental officer personnel of the Public Health Service which influence Service practices in recruitment and assignment.

The majority of dental officers are recruited while still in dental school, and they enter the

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Service directly following graduation. They are appointed as interns in hospital training programs or to general duty assignments in the many clinical programs of the Service. A relatively small number of dental officers enter after 1 or more years in private practice, teaching, or research. Although turnover among the younger officers is high, chiefly because many of them join the Service to satisfy military obligations, they nevertheless constitute the largest percentage of total dental officers. Applicants for appointment and junior officers on active duty constitute the pool from which officers are drawn to fill vacancies in all clinical programs, since competence requirements are limited to basic dental training. Programs requiring officers with some experience in the Service fill their vacancies with officers who have had 2 or more years of active duty.

In addition to the officers who enter from school or shortly thereafter, a small number are appointed somewhat later in professional life. These are dentists who possess unusual qualifications derived from postgraduate training and experience in the clinical or public health specialties or in research.

Assignment of officers is governed by three considerations: (a) the needs of the Service, (b) the qualifications of the officer (aptitude, ability, experience, potential), and (c) the interests of the officer as to type of work and geographic location. In general, the effective date of initial assignment or reassignment is July 1, because the fiscal year appropriation is effective on that date.

The character of the dental programs carried out by the Service determines, of course, the qualifications required of personnel assigned to those programs. In the clinical activities the predominant need is for clinical skills of all degrees, with emphasis also on supervisory and administrative skills in training hospitals and other multiofficer installations. In dental public health and research activities, on the other hand, clinical skills are frequently subordinated to competence in highly specialized public health and research techniques.

Since experience alone cannot always assure the competence required for advanced technical, supervisory, and administrative positions, each dental program has developed its own system

for providing special experience and training to selected officers. During any given year a substantial number of dental officers are engaged in a wide variety of training assignments. These range from rotation of officers through other programs for better understanding of Service activities and opportunities and to encourage the development of special interests, to residencies and academic training in dental and public health schools. A noteworthy feature of the training of junior officers is the broadening experience provided by rotation through assignments which vary in character, geographic location, and degree of supervision received.

Although in one sense all officers on active duty are engaged continuously in some form of training, obviously there are limitations on the number who can be diverted from the work of the Service for extended periods of formal training in facilities outside the Service. Aside from program requirements, fund limitations impose an additional restriction on the number who can be provided with training at Service expense. Nevertheless, during the 1961 fiscal year, 15 dental officers engaged in long-term outside training and 9 officers were on extended training assignments within the Service.

The Career Development Program

Because of the urgent need for adequately trained dental officers to meet the rapidly expanding responsibilities and staff the programs of the Service, the major dental activities were assigned the task of designing a system which makes maximum use of the dental officers available. To accomplish this task, representatives of each activity met and formed the Dental Career Development Committee. Committee membership consists of the chief or assistant chief of each operating program because of the necessity for immediate decisions regarding vacant positions and availability of individuals being considered. There are five members, plus a nonvoting chairman who represents the Office of the Chief Dental Officer and provides staff assistance, and a nonvoting representative of the Division of Personnel. The committee meets when called; frequent sessions are held during the second and third quarters of the fiscal year in order to complete work well in

advance of personnel actions effective each July 1.

The committee's objectives are:

1. To develop and give direction to a recruitment program which gives emphasis to the variety of opportunities for dentists in the Service and is responsive to the long-term needs of the Service.

2. To press for a meaningful and continuing program of orientation for officers entering the Service.

3. To develop the basic and specialized clinical skills of Service dentists.

4. To recognize and develop the potential abilities of new and present PHS dentists commensurate with the needs of the Service.

5. To broaden the perspective of all commissioned officers by making it possible for them to become more familiar with all PHS dental activities.

6. As abilities and skills are developed, to utilize them most advantageously for the Service.

7. To provide a ready supply of well-qualified personnel to fill key positions that become available.

8. To encourage and to provide for training opportunities.

The committee procedure consists of three main actions: (a) an annual review of each dental officer's record with recommendation that he remain in his current assignment or be reassigned, (b) a review of the needs of each operating program for dental officers for the coming fiscal year, and (c) a matching of available dental officers with program needs.

The annual review of each dental officer's file includes examination of his current status from the standpoint of progress and performance and demonstrated abilities in his present assignment, change in qualifications due to training or experience, significant comments made by supervisors on efficiency reports, and any preference expressed by the officer for a specific assignment or kind of training. From this evaluation of the officer's record, the committee, in order to improve the officer's performance and professional development, recommends that he either remain in his assignment for another year or be transferred to a more appropriate assignment. It is at this time that

specific kinds of experience and the length of the training period are considered for each officer.

About midyear, the Service dental programs develop their tentative staffing plans for the next fiscal year based on anticipated funds. By midyear it is possible to know the number of positions that can be supported and to estimate the number of vacancies that will occur because of new positions or from loss of personnel. Each program presents its needs to the committee, indicating the qualifications required for each vacant position.

In matching dental officers with positions, there are occasions when an officer could be placed in either of two programs; in these instances, the recommendation of the committee is determined by vote and majority decision. The principle of promotion from within applies also, and a program can reassign its own personnel. Similarly, officers already on duty in the Service are considered for assignment before newly appointed officers, and Regular Corps officers are given precedence in assignment over Reserve Corps officers.

All personnel actions affecting an officer produce interest and concern on his part, but this concern is accentuated by transfers to new geographic locations and to programs where responsibilities are increased or different skills are required. Frequently an officer experiences a feeling of insecurity when faced with reassignment to another program for which he possesses no special experience or competence. This is particularly true when the new assignment calls for skills which are supervisory or administrative rather than clinical.

An effort is made to anticipate and overcome possible concern about the unknown by providing officers with some understanding of all Service dental activities. General acquaintance with the organization, functions, and programs of the Service is provided through various orientation courses and by supplying publications descriptive of the Service dental activities. Dental officers in clinical assignments are encouraged to visit and become more familiar with public health and research programs and projects when opportunity affords.

A more specific opportunity to become better acquainted with other dental activities is pro-

vided when an officer is under consideration for assignment to a particular program. Frequently the officer is invited to make a special visit to learn more about the program and is interviewed by one or more program directors in order to stimulate and determine his degree of interest in the program and evaluate his qualifications and potential. While the program for which the officer is being considered may be described in detail, no offer of an assignment or other commitment can be made until the officer has been reviewed by the Career Development Committee and agreement reached (a) that he is eligible for reassignment, (b) that reassignment to the program desiring the officer is in accordance with the needs of the Service, the qualifications of the officer, and his interests, and (c) that the officer shall be so reassigned.

Division Program

To meet its particular needs, the Division of Dental Public Health and Resources has developed specialized training within the framework of the career development program for dental officers.

The interviews conducted by the division include a description of the division's special 3-year career development program for officers who are entering public health activities from a clinical background. In the first year, the officer is assigned to one of the Public Health Service's regional offices as a trainee member of the dental staff. The trainee then enters upon a carefully planned schedule of activities designed to acquaint him with public health activities in local and State health departments and with the program and operation of the Public Health Service regional office. He becomes familiar with the responsibilities of the regional office and its working relationships with other agencies, actively participates in the regional office program, and acquires a general understanding of dental public health. Special effort is made to have the trainee plan and carry out at least one dental health project. Twice during the year, the trainee is evaluated by his supervisor, and at the end of the year he writes an extensive report of his experience, including an evaluation of the training program and the supervision received. Before the end of the

year, the officer knows whether or not he would like to continue in dental public health, and a decision is made whether he will be recommended for continuation in the training program or for reassignment elsewhere in the Service.

During the second year, the officer is assigned to a school of public health of his choice for formal training. School officials report periodically on the academic progress and outstanding qualities of the officer, both favorable and unfavorable.

In the final year of the career development program, the officer is assigned to a State health department dental program, essentially in the status of a State employee, for experience as a full-time working member of the State health agency. Again, this experience is carefully planned to provide appropriate learning situations. From this assignment the trainee gains firsthand understanding and "know-how" by applying the theoretical principles of public health administration and practice at both the State and local level.

A dental officer does not begin this prolonged training, which involves four transfers within 3 years and a heavy financial investment by the Service, without first receiving a careful explanation of the program. Occasionally, a candidate prefers to remain in clinical dentistry, usually because he has a strong interest in some field of clinical practice. A married officer is asked to discuss the proposal with his family before agreeing to participate in the training program. Experience has shown that the normal aversion of an officer and his family to frequent change in geographic location becomes of minor concern when weighed against the very real advantages to be gained.

In practice, the division's career development program in dental public health does not always follow the ideal pattern presented here. Although every effort is made to adhere to the 3-year sequence of assignments, there are times when pressure to supply staff for rapidly expanding and new programs forces curtailment of training schedules. At various times, the year spent in the regional office or the year in the State health department is dropped or postponed, and some trainees have gone directly to public health school from clinical backgrounds.

Sometimes, the usual sequence is changed, and an officer is assigned to a regional office and then to a State health department before formal training. In the main, however, the accelerated version has been avoided whenever possible.

In one respect the division program has been inadequate, and that is in the relatively small number of dental officers who can be provided with training during a given year. However, over the past 15 years or more, 25 officers have been trained in dental public health; 15 are currently with the division. During fiscal year 1961, nine officers were at various stages in the division training program, and four of them completed training that year.

It might be expected that, because of the transition from clinical to public health practice, attrition would be high and that some officers either would not complete training or would want to return to clinical dentistry after training was completed. However, only four officers have been lost to the division for these reasons. Of these, three are now in clinical dental activities of the Service and only one has left the Service. This record indicates that the career development program in dental public health has been moderately successful in serving the needs of the division and in attaining its objectives.

Conclusions

The Service-wide dental career development program has effectively served its objectives in providing a review mechanism to meet the needs of the Service by periodic evaluation and assignment of dental officers to greatest advantage. The series of training assignments that officers receive provide a basis for evaluating their interests, aptitudes, and potential and for selection of officers for special training to fill immediate and long-term needs of programs. At the same time, officers can acquire advanced skills in special fields and so gain greater job satisfaction and improved opportunities for professional advancement. The officer, furthermore, has opportunities to gain a variety of experiences, enabling him to judge intelligently which type of duty interests him the most.

Due consideration by the Public Health Service Dental Career Development Committee of these elements of personnel development has brought reasonable assurance of a coordinated, systematic, and productive approach in developing trained dental officers to fill key positions as they occur and in meeting the staffing requirements of the growing dental programs of the Public Health Service. Higher officer morale and improvement in service to the public are the ultimate benefits from such an approach.

Epidemiology for Nurses

A refresher course for nurses in communicable disease control, with emphasis on epidemiologic and statistical principles and techniques, will be held at the Communicable Disease Center, Atlanta, Ga., February 5 through 23, 1962.

Epidemiologic principles, the role of the laboratory in epidemiology, and the application of practical statistical methods to the problems of field epidemiology are considered through the study of current major communicable diseases. Also included are the principles on which nursing care in communicable diseases is based.

Communicable disease nursing consultants, public health nursing supervisors, educational directors, qualified public health staff nurses, industrial nurses, instructors in schools of nursing, and other nurses having supervisory, teaching, or consultative functions are eligible for admission to the course.

Symposium on Biological Communications

In October 1960 a symposium was held in Philadelphia under the auspices of Biological Abstracts to discuss ways of improving biological communications. Both information specialists and biologists took part in an effort to solve the problems caused by increasingly numerous and diversified scientific publications. Following are excerpts from their work.

A Philosophical Approach

It is the complaining user of scientific information who, as a producer of more scientific information, is responsible for the multiplication of journals and articles. However, it is the same user and producer of scientific information—the individual scientist—who has the authority to create new journals, obsolete old ones, or consolidate them. To judge from the results of the scientist's unrestrained "authority," he is in danger of creating a monster out of the present journal system of reporting and recording scientific information. Journals are started for prestige purposes. South America, with about 3,000 biologically related serials, is a prime example of this; journals are started so that they may be traded with other journal publishers—a sort of biological philately; and ever-splintering and specialized interests in science are founding new journals every day. . . .

It can be estimated that in the 200 years behind us a grand total of 8 million articles have been published, whereas in the 40 years between now and 2000 A.D. about 39 million articles may be published. The years behind us averaged 40,000 articles per year, ahead of us the average will be about 1 million. If we adopt the more generous estimate of 20,000 currently published serials, the projections ahead seem quite fantastic. Behind us are 27 million articles, ahead of us in the next 40 years are 132 million. . . .

Whereas there are about 1 million scientists in today's world, it is quite likely that there will be 20 or 30 million by the end of the century. . . . It has been frequently estimated that there are a total of 50,000 or 60,000 scientific serials extant today.—G. MILES CONRAD, director, *Biological Abstracts*.

Molecular Biology

The real problem of the biological scientist is not so much to gather the literature, but to read the huge bulk that is pouring into his libraries and laboratories. In addressing themselves to this problem, the bibliographers have made several interesting suggestions; for example, the publication of abstracts or semi-papers as primary publications. I, for one, believe this would be a mistake. When I read a paper I want to know exactly how the experiments were performed. I want to know why the author carried them out, and I want to know the conclusions he drew from them, and I don't think you can get these from an abbreviated paper.

Raw scientific data are meaningless. They acquire meaning only insofar as you consider them against the background of the investigator's purpose in carrying out the work. Granting that many papers suffer from verbosity, an abstract or abbreviated paper, omitting the author's theses or experimental protocols would, I believe, be almost worthless to a critical, informed reader.

I have a second, probably more serious objection to the publication of abbreviated papers as primary publications, and that is that I think they do violence to the basic motivations of scientists. The popular stereotype of the scientist as one who is concerned only with obtaining new facts as an end in itself could not be further from the truth. As I see it, the scientist is a creative person in the same way as is the

artist or composer; if you will, even the poet. Just as a painting or a sonnet has an internal structure, so does a scientific paper. All of these forms of expression are means of communication in one way or another. A scientist's pride of authorship in carrying an idea through a series of logical developments is just as keen as the artist's or poet's; in my opinion a beautifully constructed paper would suffer as much by abbreviation as would a Beethoven concerto.

Much so-called scientific production may be drivel, but so is most music or art or literature. It seems to me that this is the price we have to pay for the good scientific production. Besides, history should teach us that no one can say what is good and what is bad in the present day. It seems to me that a good society should cherish its creative people and make it possible for them to have the utmost freedom of expression. I think we should be careful not to curtail this freedom by setting up artificial barriers for the sake of expediency.

I think we can well afford the cost of allowing scientists full expression; in fact, it seems to me that we can't afford to do otherwise.—Dr. SIDNEY WEINHOUSE, *chairman, division of biochemistry, Institute for Cancer Research.*

A Biologist Views Communications

New ideas, those concepts that are fundamentally new, rarely receive prompt acceptance or even recognition. They seem to have to go through a period of incubation if not outright rejection. Perhaps the stretching of the mind is so painful that we shy away from it. Today, still, the risk of missing a new idea in full view is probably greater than the danger of losing sight of papers and books published in out-of-the-way places.

The fractionation of biology has brought with it the concomitant development of a separate jargon for each subfield, and thereby an even greater confusion of the basic language of science. My remarks here are limited only to English. When one compounds this with all the languages in which science appears in print, the problem becomes even worse.

One unfortunate outcome of the great complexity of terminology is that the time of specialists must be diverted from their research

to such housekeeping functions as editing, abstracting, reviewing, and data processing. Scientists tend to invent neologisms whereas the social scientists tend to endow existing words with special meanings evident only to themselves. Therefore, semantic problems are with us to stay, and words will always mean different things to different people.—Dr. WILLIAM C. STEERE, *director, The New York Botanical Garden.*

Genetic Biology

It is now very simple for a scientist to do his research, publish his findings, and have his findings deposited in a library. But in a library they tend to be buried. It is easy to place our contributions in a library. It sometimes becomes impossible to get them out again. We, of course, can find our own masterpieces, but others can't.

No system of library classification can begin to be adequate. Of one thing, however, we may be sure. Innumerable scientific discoveries are buried in our libraries, and many will be exhumed, but only after they have been discovered anew, and discovered independently. Many of our scientific discoveries now might just as well not be made.

For some years now I have been investigating the history of biology. In every field in which I have done any research, I have always found a number of precursors, that is, men who did the work earlier but who were ignored. Over and over again I have found forgotten work that could have advanced our science by many years—perhaps by many generations.

Today approximately 1 million scientific papers are published each year. When placed end to end they will reach to utter confusion. As individuals we have long ago given up the attempt to keep up with such numbers of publications, and we have had to specialize. Thus we sacrifice our fundamental information—the information we need as human beings—in order to master a single field adequately.

We have to become specialists. If we are not specialists, we are nothing. But there is always the touch of the sophomore in every specialist. The intellectual confusion that plagues our times is easy to account for. We simply do not

have any techniques for organizing or using all we know. Our knowledge is scattered and fragmented, and we do not know how to bring it together and organize it into a whole.—DR. CONWAY ZIRKLE, *professor of botany, University of Pennsylvania.*

Environmental Biology

When I was an instructor at Ohio State, my senior colleague, Dr. Transeau, asked me to abstract pertinent material from the *Proceedings of the Royal Society of London*, Series B. There I became acquainted with good science, good writing, and the clear thinking which underlies both. This led me later to spend some time with Bateson in England, to my lasting benefit, although my subsequent work has been in other fields than his.

Since then I have been quite interested in finding out why so many of our English colleagues can communicate as effectively as they do. Godwin's practice at Cambridge is, I think, typical. His graduate students in botany are expected to do a good deal more writing than ours are. These papers are not merely graded and handed back, but Godwin and his colleagues

go over each with the greatest editorial care, and then call in the perpetrator to discuss the paper bit by bit for style, expression, diction, and, of course, content. I think at least some of the problems we have been discussing the last 2 days could be partially solved if we made more use of such a technique.

Especially difficult is the problem of environmental biology as it relates to the dominant species, man. Where purely physical or physiological matters are concerned, there should not be much trouble. But it is today more and more evident that some of the most important aspects of human ecology, including those which have profound effects upon other organisms, have their seat in the intangible values and conflicts of values that are peculiar to the various cultures of mankind. Culture itself, both in its operation and its sanctions, is a basic factor in modern ecology.

My main suggestion here then is that in our selection of pertinent material, we remember that biological science is not only expanding into the realms of the infinitely small, but broadening into the baffling and difficult realm of the intangible.—DR. PAUL B. SEARS, *professor of botany, Yale University.*

U.S. Birth Rates

About 40,000 more babies were born in the United States in 1959 than in 1958. Of the 4,295,000 live births in 1959, 51 percent were births of a first or second child, 19 percent of a third child, and 29 percent of a fourth or later child. The percentage of fourth or subsequent children born into American families in 1959 was significantly higher than in 1958.

In 1959 the median age for women having their first child was 21.6 years, slightly lower than the 21.8 figure for 1958. In 1940 the median was 23 years, and in 1950, 22.7 years.

Women aged 20-24 years had the highest birth rate; one out of four gave birth in 1959. The corresponding rate for women aged 25-29 years was one of five.

Provisional figures show there was prac-

tically no change in the number of births between 1959 and 1960. But for the first 4 months of 1961, there appears to be a sizable increase over the same period in 1960. This may be due to a rise in the number of first births which usually follows a rise in the number of marriages. From 1959 to 1960 marriages rose by about 2 percent.

In 1959 there were an estimated 52 illegitimate births out of every 1,000 live births, or a total of 221,000 illegitimate births in the United States. The illegitimacy ratio was highest among teenagers. Mothers under 15 years of age had an estimated 679 illegitimate births per 1,000 live births. At ages 15 to 17 years the ratio was 242 per 1,000 live births, and at ages 18 to 19, 106 per 1,000 live births.

Legal Note . . . Air Pollution Nuisance

A rendering company operating for 50 years in an area which, although originally sparsely settled, gradually became populated, held not entitled to continue operations causing noxious odors resulting in public nuisance. *State ex rel Board of Health v. Sommers Rendering Co.* (N.J. Super. Ct. App. Div. 1961) 169 A. 2d 165.

About 50 years ago the Sommers Rendering Co. established a rendering plant in the township of Saddle Brook, N.J., where it cooked and processed butcher-shop waste fats and dead animal stock to produce a tallow. At that time, the township was rural and sparsely settled, but with the passage of time it had become a considerably populated residential area.

The local board of health had sought and obtained an injunction in the lower court to prohibit the continued operation of the plant as a "nuisance hazardous to the public health," a proceeding authorized by statute (N.J.S.A. 26:3-56). The company appealed contending, among other things, that its operations did not constitute a public nuisance within the meaning of the statute, that its operations had not changed over the years, and that the order of the lower court requiring the correction of "certain conditions" contributing to foul odors was too vague to be enforceable.

The testimony at the trial established that unbearably foul and noxious odors emanated continuously from the plant except when it was not operating. These odors, characterized as "very vile," "sickening," and "nauseating," produced extreme discomfort to nearby residents, caused some of them to become ill, made it necessary to keep their doors and windows closed, spoiled their meals, and interfered with normal social and family functions.

The appellate court held that odors so described were "foul and noxious odors" and their disturbing effects clearly constituted them a nuisance hazardous to the public health.

The court noted that under the cited statute it was not necessary to establish an actual injury to health but only the likelihood of injury. The statutory test, it said (p. 168), was not "whether the condition created by the defendant will inevitably

result in disease, but whether the condition constitutes a hazard, danger or peril to the public health by its presence." Since the odors originating from the defendant's plant caused severe discomfort and interfered with normal activities, they were held to jeopardize the public health and hence were enjoined as a public nuisance.

Turning to the long period of defendant's operation, the court held that the passage of time did not create a vested right to continue a nuisance and declared that "carrying on an offensive trade for 20 or more years in a place remote from buildings and public roads does not entitle the owner to continue in the same place after houses have been built and roads laid out, if such continuance is a nuisance to the residents in those houses and to travelers on the roads."

On this appeal, the defendant attacked two provisions of the injunction as being insufficient because they were indefinite. The first enjoined the defendant from conducting its business "in such manner as to cause the emission and prevalence of foul and noxious odors" in the vicinity of its plant. This language was held reasonably clear and specific for, as the court said, "It is hard to describe a bad smell." The argument that the court should have enjoined only specified features of the defendant's operation was rejected as unsound, since the defendant knew or should know what caused the odors. The lower court had properly enjoined the results of plaintiff's operation, and compliance with the order would prevent the mischief aimed at. A violation of this provision of the injunction, the court noted, would be punishable as for a contempt.

The second portion of the lower court's order directed the defendant to "immediately" correct "certain conditions" contributing to the odors or to cease its rendering operations. This language, the appellate court agreed, was indefinite, because it

failed to identify the conditions to be corrected, and unreasonable, in that by requiring "immediate" action it did not afford the defendant a reasonable opportunity to take remedial action. The court struck down the second provision but added the warning, "We do not preclude the possibility of a court order that might require the defendant to cease operations of its plant, if such a course is eventually necessary, if the defendant cannot or will not correct a nuisance hazardous to the public health."

Comment: This case illustrates a situation which is becoming more and more frequent as communities spread out over what was once a rural area. When businesses characterized by odors, dust, or noise become surrounded by residences, they may be faced with the necessity of revising their operations to eliminate their offensive nature or, if this is not possible, to seek new and more sparsely populated locations.—SIDNEY EDELMAN, *assistant chief, Public Health Division, Office of General Counsel, Department of Health, Education, and Welfare.*

PUBLICATION ANNOUNCEMENTS

Address inquiries to the publisher or sponsoring agency.

Criteria for Evaluating the Administration of a Public Health Nursing Service. 1961; 36 pages; 1-9 copies, 25 cents, reductions for larger quantities. National League for Nursing, Department of Public Health Nursing, 10 Columbus Circle, New York 19.

Voluntary Health & Welfare Agencies in the United States. An exploratory study by an ad hoc citizens committee. Robert H. Hamlin, M.D., M.P.H., LL.B. 1961; 88 pages; \$1. The Schoolmasters' Press, 82 Morningside Drive, New York 27.

Inhaled Particles and Vapours. Proceedings of an International Symposium organized by the British Occupational Hygiene Society. Oxford, 29 March-1 April 1960. Edited by C. N. Davies. 1961; 516 pages; \$15. Symposium Publications Division, Pergamon Press, Inc., 122 East 55th St., New York 22.

Life Insurance Fact Book, 1961. 28 pages. Institute of Life Insurance, 488 Madison Ave., New York 22.

Social Insurance. Some problems for statistical research. Papers presented at the annual meeting of the American Association for the Advancement of Science, New York, December 1960. Edited by Lincoln H. Day. 1961; 71 pages. The Bureau of Applied Social Research, Columbia University, New York.

An Evaluation of Door Lock Effectiveness: Pre-1956 vs Post-1955 Automobiles. By John W. Garrett. July 1961; 52 pages. Automotive Crash Injury Research of Cornell University, 316 East 61st St., New York 21.

Blondie (mental health comic book). Text by Margaret M. Farrar. 1961; 16 pages. New York State Department of Mental Hygiene, Albany, N.Y.

Nursing Home Administration. Training materials for administrators of nursing, boarding, and mental hygiene homes for the aged. By John D. Gerletti, Ed.D., C. C. Crawford, Ph.D., and Donovan J. Perkins, M.S. 1961; 472 pages; \$6.50. Attending Staff Association, 400 Building, Room 129, 7601 Imperial Highway, Downey, Calif.

World Health Organization

WHO publications may be obtained from the Columbia University Press, International Documents Service, 2960 Broadway, New York 27.

Evaluation of the Carcinogenic Hazards of Food Additives. Fifth report of the Joint FAO-WHO Expert Committee on Food Additives. WHO Technical Report Series No. 220. 1961; 33 pages; 60 cents; Geneva.

Scientific Meeting on Rehabilitation in Leprosy. Report. WHO Technical Report Series No. 221. 1961; 36 pages; 60 cents; Geneva.

The Role of Immunization in Communicable Disease Control. Public Health Papers 8. 1961; 118 pages; \$1.25; Geneva.

Teaching of Psychiatry and Mental Health. Public Health Papers 9. 1961; 186 pages; \$2; Geneva.

Control of Soil-Transmitted Helminths. Public Health Papers 10. By Paul C. Beaver. 1961; 44 pages; 60 cents; Geneva.

World Directory of Dental Schools. 1961; 228 pages; \$5. Geneva.

Areawide Planning for Hospital Facilities

The Joint Committee of the American Hospital Association and the Public Health Service assigned to develop principles for planning health facilities for local areas has recently issued its report, "Areawide Planning for Hospitals and Related Health Facilities." The 15-member committee, headed by George Bugbee, president of the Health Information Foundation, began work in February 1960. Their report presents a review of the need for and status of communitywide planning, and offers guidelines for organizing local planning agencies, collecting data, and developing and putting into effect an areawide plan.

The report cites a wide range of problems that argue for more definitive, better coordinated, and more farsighted planning geared to the needs of the area. For example, general hospital costs per patient-day have increased in the past 10 years by about 111 percent, while the consumer price index rose about 22 percent. The average hospital bill has risen nearly threefold since 1946, even though the average stay has become shorter. Area planning that will lead to the most efficient and economical use of hospital plants is needed to help combat these steeply rising cost trends.

Uncoordinated planning has resulted in imbalances in the distribution of health facilities. Fast-growing suburbs, sections of large cities predominantly inhabited by minority groups, and some rural communities are particularly affected by shortages. In other places, there is an excess of services frequently resulting in higher operating costs.

Obsolescence of facilities is another major problem. According to a 1960 survey of hospitals by the Public Health Service, about \$3.6 billion is needed to modernize or replace obsolete facilities without adding to bed capacity. The question of replacement is complicated in many urban areas by population shifts away from present facilities to new neighborhoods.

Pressing situations have arisen also as a result of limited financial support for health

facilities. Blue Cross and other insurance plans have lowered financial barriers to general hospital care, resulting in increased demand for services. Since voluntary insurance plans usually exclude nursing home, mental, and ambulatory care from benefits, there has been economic pressure to use the acute general hospital for patients who might obtain the required care more appropriately from less costly facilities. At the same time, the lack of assurance of adequate operating funds has deterred the development of high-quality nursing homes, rehabilitation facilities, and home care services.

Financial aid from local, State, and Federal governments for health services can also cause imbalances among various types of services, since the payments are not always in relation to needs.

Fund-raising drives by individual hospitals are gaining disfavor as contributors recognize that effective solutions to hospital care problems depend on planning for the community's hospital system as a whole.

Until the enactment of the Hill-Burton Act in 1946, there was little effort at areawide planning of health facilities. The introduction of systematic statewide planning was one of the most important accomplishments of the Hill-Burton program. More effective planning mechanisms for densely populated areas are still urgently needed, however.

Some of the larger metropolitan areas have organized planning associations and are demonstrating a substantial capacity to meet the problems of urban areas. More than a dozen large cities have established such groups, mostly in the last 10 years. The AHA-PHS committee strongly urges the formation of planning groups in other communities by voluntary or official action.

In the committee's suggested framework of organization for such agencies, the agency would be governed by a board of lay and professional community leaders. Expert technical advice would be readily available either

from board members or from advisory committees. The agency staff would be headed by a director with professional experience in the health and hospital fields.

The operating funds of the agency should come from a variety of sources and in such a manner as to assure the objectivity and independence of the organization. The agency's role in receiving and disbursing capital funds, its relationships with the State Hill-Burton agency and other organizations, and how its geographic area of jurisdiction might be determined are also discussed in the committee report.

A major task of the planning agency will be to collect and analyze data on population and community characteristics, existing services, quality of services, patterns of health facility usage, and other subjects. Through the information obtained, the needs of the area in the years ahead and the financial resources that will be available can be estimated. The calculation of future needs is discussed in some detail in the committee report. Factors to be considered in mapping the geographic distribution of facilities and determining priorities for allocating funds for construction are also presented.

Through areawide planning, the report states, local agencies can help to:

- Maintain and improve quality of care as economically as possible.
- Correct deficiencies in existing facilities and services.
- Stimulate the construction of needed facilities, including those for educational purposes.

- Discourage construction not conforming to community needs.

- Assure more effective use of community funds by avoiding unnecessary duplication of highly specialized, infrequently used, expensive facilities.

- Improve patient care by developing more effective interrelationships among facilities.

- Develop an orderly distribution of all facilities in keeping with the projected population characteristics and the overall community development.

- Encourage individual facilities to define and carry out their objectives and projected roles in relation to other facilities, services, and community needs.

- Stimulate facilities to recognize opportunities for improved coordination of services.

- Demonstrate the need for philanthropic and public funds through a well-developed information program.

Reference data on aspects of American society, health services and facilities, and economics of health care are contained in the 20-page appendix to the report. A list of publications on health facility planning in metropolitan areas is also included.

Free single copies of the report (PHS Publication No. 855) are available from the Public Inquiries Branch, Office of Information, Public Health Service, Washington 25, D.C. Additional copies may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., for 35 cents a copy.

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Psychiatric Clinic Outpatients, Maryland

A methodological study was conducted of Maryland residents seen in outpatient psychiatric clinics during the 12-month period ending June 30, 1959. The purposes of the study were (a) to test and improve methods of collection of outpatient psychiatric clinic data and (b) to develop methods of analyzing these data as an aid in program planning and in epidemiology of mental diseases.

Field study of records, consultations with clinicians, and experimentation with items and definitions, resulted in a number of recommended revisions to uniform nationwide reporting. In national data, 22 percent of patients terminated from clinic service are reported with psychiatric classification unknown. In the Maryland study, where a formal diagnosis by a psychiatrist could not be reported, an impression of the mental disorder by other professional staff was requested. As a result, only 2 percent of cases were reported without psychiatric information. In addition to psychiatric classification, data were collected on the symptom of excessive drinking.

As a result of an intensive educational effort, reports were received on all Maryland residents seen in outpatient psychiatric clinics in the State or in nearby District of Columbia facilities. It was possible therefore to compute

rates of clinic admission and of termination for a population. In addition, by the use of sampling methods an estimate was made of the amount of "duplication" in these rates due to individuals who were admitted or terminated more than once during the year.

Services are generally described only for patients who have been terminated from clinics. Although clinic services are usually of short duration, studies of discharged cases could introduce serious bias. In the Maryland study, cohorts of admitted patients were followed to provide exact answers to questions on the duration of service and the kind of service received. The general methodology of life tables was extended, with appropriate assumptions and mathematical models, to the situation where time of entry and of departure of cohort members are known only by calendar month. The methodology used all available data, incorporating the experience of persons with short observation period. The probability that services will end within a specified time after admission and that a specified type of service, disposition, or number of interviews would be received, was also obtained.

The need for a statewide psychiatric case register of individuals seen in all types of psychiatric facilities was pointed out. Only in

Public Health Monograph No. 65

Methodological Study of Population of Outpatient Psychiatric Clinics, Maryland, 1958-59. By Anita K. Bahn. Public Health Monograph No. 65 (PHS Pub. No. 321), 105 pages. U.S. Government Printing Office, Washington, D.C., 1961, 55 cents.

The accompanying summary covers the principal contents of Public Health Monograph No. 65, published concurrently with this issue of *Public Health Reports*. The author is chief of the Outpatient

Studies Section, Biometrics Branch, National Institute of Mental Health, Public Health Service.

For readers wishing the data in full, copies are on sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. Official agencies and others directly concerned may obtain single sample copies without charge from the Public Inquiries Branch, Office of Information, Public Health Service. Copies will be found also in the libraries of professional schools and the major universities and in selected public libraries.

this way can systematic followup information be obtained on the psychiatric course and the natural history of various diagnostic disorders, as well as unduplicated patient counts.

Characteristics of Patients

Admission and termination rates in non-metropolitan counties are relatively high for children and low for adults; in Baltimore City this is reversed. Rates in Baltimore City are nearly twice as high for nonwhites as for whites during early adulthood. Clinic rates for boys greatly exceed those for girls; by about age 30, however, this difference by sex has disappeared, and among older nonwhites, rates are even higher for females.

The preschool child and the aged have the lowest clinic rates of admission. High rates for school children are followed by a decline in late adolescence and then a secondary rise around age 30 to 40 years. A gradual decline after the age of 40 to outpatient care is accompanied by an increase in the rate of inpatient admission. A fifth of the adult clinic admissions are to the followup care clinics of the State mental hospitals and another fifth are readmissions, indicating a patient population of considerable chronicity.

Brain syndrome rates are fairly consistent throughout all age groups as a result of an early peak associated with prenatal and perinatal factors, a middle peak associated with convulsive disorders and alcohol intoxication, and a late peak associated with degenerative diseases. Idiopathic mental deficiency, on the other hand, is diagnosed in clinics primarily at school age (5-14 years).

The diagnosis of psychotic disorder is rare below the age of 5; the rate rises exponentially in early adolescence, doubling for each subsequent 5-year age group to young adulthood, and then begins to decline. The age curve for psychotic disorder in females is of the same general shape as that for males but tends to be "displaced" around 5 to 10 years later on the age scale.

The rate for psychoneurosis rises somewhat earlier than that for psychosis; for males the increment slackens in late adolescence so that adult female rates exceed male rates. Person-

ality disorders show the greatest difference by sex; childhood rates for males are about three times as high as those for females and in adulthood they are about twice as high. Personality disorders generally decline after the age of 20 or 25 but some increase occurs around age 40 for whites due to alcoholism (addiction). Transient situational personality disorders (adjustment reactions) reach a peak in adolescence but are rare after school age. Psychophysiological autonomic and visceral disorders represent less than 2 percent of all clinic diagnoses.

Patients classified as having alcoholism (addiction) or with brain syndrome associated with alcohol intoxication represent less than half of the adult patients 20 years of age and over identified as excessive drinkers.

Services

Outpatient psychiatric clinic service tends to be brief; 56 percent of all patients receive their final interview by the end of the first month after admission, 83 percent by the end of the eighth month. The probability of leaving in each month is higher for children than adults, and generally higher for nonwhites than whites. Relatively low retention rates are found for groups which also have relatively low admission rates: preschool children, aged persons, female children. After 25 years of age, retention rates are higher for females than males. Clinic stay is longer for the readmitted patient, for the metropolitan as contrasted with the non-metropolitan resident, and for the Baltimore City white resident from the high economic area as compared with the low.

Referrals to other agencies for further service accounts for three-fifths of those who leave in the first month and about a third of those who leave in subsequent months. Inpatient and other outpatient psychiatric services are the principal agencies to which adults are referred; most children are referred to nonpsychiatric agencies for further service. "Self-termination" accounts for over a fourth of the adults who leave in the first month, and over half of those who leave in subsequent months; three-fourths of these patients do not notify the clinic of their intention to withdraw.

Federal Publications

Outpatient Psychiatric Clinics Directory, 1959. *The National Association for Mental Health, Inc., in cooperation with the National Institute of Mental Health, Public Health Service; 199 pages; \$1.50.*

This comprehensive, nationwide directory of outpatient psychiatric clinics and other mental health resources in the United States includes basic information for more than 1,400 regularly scheduled clinics in which a psychiatrist takes medical responsibility for clinic patients.

The directory lists State and Federal hospitals for the mentally ill and the mentally defective, State mental health associations, State departments dealing with mental health, and all regional offices of the Department of Health, Education, and Welfare.

Single copies are available without charge at the National Institute of Mental Health, Public Health Service, Bethesda 14, Md. Additional copies are available at the National Association for Mental Health, 10 Columbus Circle, New York 19.

Film Reference Guide for Medicine and Allied Sciences. *PHS Publication No. 487; 1961; 200 pages; \$1.* Lists 2,000 films and filmstrips considered useful to member agencies of the Interdepartmental Committee on Medical Training Aids. Gives technical information on each title, abstract of content, and precise information on distributors and procurement procedures.

The Comparability of Reports on Occupation From Vital Records and the 1950 Census. *Vital Statistics—Special Reports, vol. 53, No. 1, June 1961; by David L. Kaplan, Elizabeth Parkhurst, and Pascal K. Whelpton; 44 pages.*

Initiating a new series of occupational mortality, this study was made to measure differences in the United States in reporting occupa-

tion census schedules and on birth and death certificates of the vital records system. Methodology, analysis of occupation reporting, and comparability of reports on other subjects are given.

Rural Health. Selected annotated references, January 1953–June 1960. *Agriculture Miscellaneous Publication No. 860; by Elsie S. Manny, William G. Yanniello, and Helen L. Johnston; 1961; 39 pages; 25 cents.*

This booklet, published in cooperation with the Public Health Service, was compiled to meet the need for information on social research in the field of rural health. It should be useful to persons engaged in research, health education, community health activities, and other types of health activities in rural areas.

Agricultural Migrants Selected Films. *PHS Publication No. 869; August 1961; 16 pages.*

Health education films for use with migrant workers and their families and films aimed at improving community understanding of the migrant and his problems are listed. Many of the films are available in both English and Spanish.

Clinical Center Patient Admission Procedures. *PHS Publication No. 500; 1961; leaflet.* Brief description of the organization and functions of the Clinical Center and the research program of the National Institutes of Health. Explains how Clinical Center patients are selected and outlines in detail the admission procedures.

Medical Care in the United States. The role of the Public Health Service. *PHS Publication No. 862; 1961; 37 pages; 35 cents.*

This report, from the National Advisory Health Council, discusses the problems of meeting the medical care needs of the nation and the role of the Public Health Service with

respect to organization, administration, and financing of personal medical services. The Council recommends that the Service, in cooperation with other governmental and voluntary agencies concerned, exercise leadership in these areas and others pertaining to development of manpower resources and medical research, strengthening of medical care facilities, promotion of standards of care, and coordination of governmental medical care activities.

The Living Waters. *PHS Publication No. 382; revised 1961; 22 pages; 25 cents.*

This booklet tells the story of water, its many uses, and the need to keep it clean. It relates, briefly, the history and nature of water and deals with pollution and the methods by which man combats the problems.

Health Statistics from the U.S. National Health Survey.

DISTRIBUTION AND USE OF HEARING AIDS, WHEEL CHAIRS, BRACES, AND ARTIFICIAL LIMBS, United States, July 1958–June 1959. *PHS Publication No. 584-B27; 1961; 24 pages; 25 cents.*

HEALTH INTERVIEW RESPONSES COMPARED WITH MEDICAL RECORDS. *PHS Publication No. 584-D5; 1961; 74 pages; 45 cents.*

ATTITUDES TOWARD COOPERATION IN A HEALTH SURVEY EXAMINATION. *PHS Publication No. 584-D6; 1961; 45 pages; 35 cents.*

This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

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